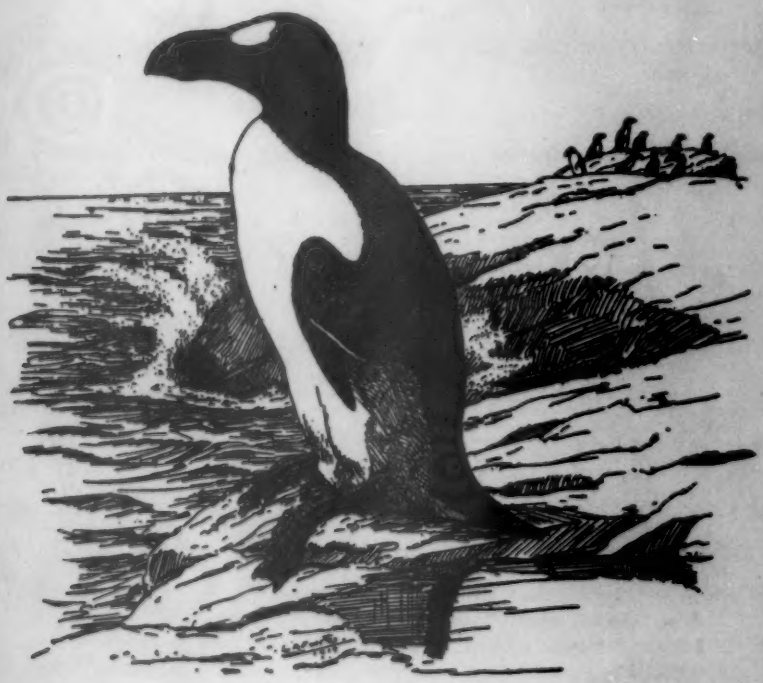
CONTINUATION OF THE
BULLETIN OF THE NUTTALL ORNITHOLOGICAL CLUB

The Auk

A Quarterly Journal of Ornithology

Vol. 65 JULY, 1948 No. 3



PUBLISHED BY

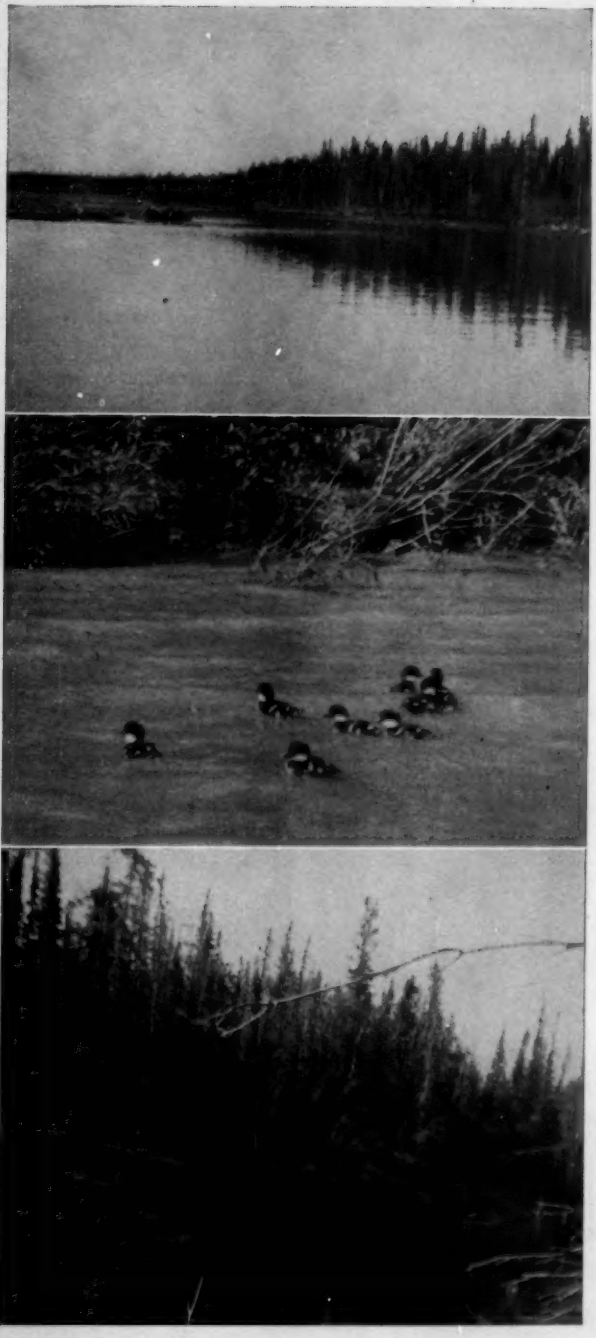
The American Ornithologists' Union

LANCASTER, PA.

Entered as second-class mail matter in the Post Office at Lancaster, Pa.

Accepted for mailing at special rate of postage provided for in the Act of October 3, 1917, embodied in paragraph 4, section 538, P. L. and R., authorized May 15, 1920.

CONTENTS



(*Top*) SCOW CHANNEL, ONE OF THE RIVERS CONNECTING THE PEACE AND SLAVE RIVERS. (*Middle*) DOWNY YOUNG AMERICAN GOLDEN-EYES ON THE PEACE RIVER, JUNE 20, 1940. (*Bottom*) LITTLE BUFFALO RIVER, ABOUT 100 MILES SOUTH OF GREAT SLAVE LAKE.

THE AUK

A QUARTERLY JOURNAL OF ORNITHOLOGY

VOL. 65 JULY, 1948 No. 3

BIRD DISTRIBUTION ALONG THE PEACE, SLAVE AND LITTLE BUFFALO RIVERS OF CANADA

BY STEPHEN W. EATON

Plate 10

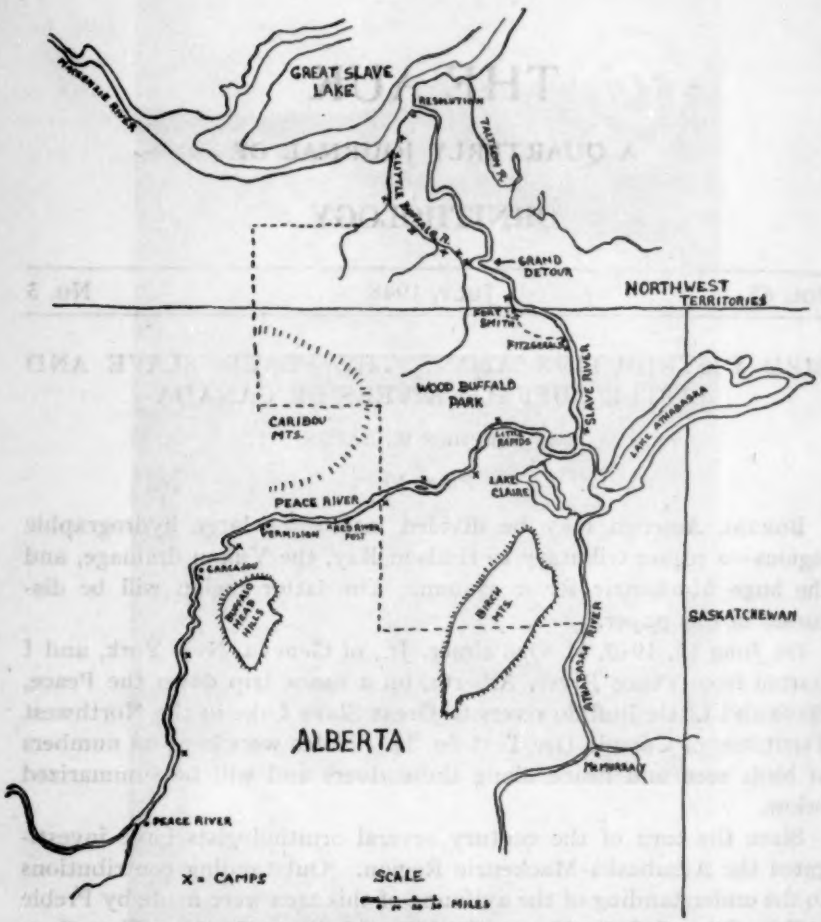
BOREAL America may be divided into three large hydrographic regions—a region tributary to Hudson Bay, the Yukon drainage, and the huge Mackenzie River system. The latter region will be discussed in this paper.

On June 15, 1940, H. O. Palmer, Jr., of Geneva, New York, and I started from Peace River, Alberta, on a canoe trip down the Peace, Slave and Little Buffalo rivers to Great Slave Lake in the Northwest Territories of Canada (*see* Text-fig. 1). Notes were kept on numbers of birds seen and heard along these rivers and will be summarized below.

Since the turn of the century several ornithologists have investigated the Athabaska-Mackenzie Region. Outstanding contributions to the understanding of the avifauna of this area were made by Preble (1908), Seton (1908), Harper (1925), and Soper (1942). These men traveled down the Athabaska and Slave rivers to the Great Slave Lake area. Our route in 1940 differed in that we took the Peace River from the village of Peace River, Alberta, and followed this to its confluence with the Slave River.

ITINERARY

We traveled by seventeen-foot canoe approximately 600 miles along these rivers to Fort Resolution, N. W. T. By paddling and drifting with a four to six-mile current we averaged about 50 miles a day and camped along the river banks at night. Three portages were made: the first, near Red River Post on the Peace River at Vermilion Falls; the second, at Fitzgerald on the Slave River around



TEXT-FIGURE 1.—Route down the Peace, Slave and Little Buffalo rivers.

Smith Rapids; and the third, from the Slave River west to the Little Buffalo River.

To run the Peace River required about two weeks, and we made our first camp on the Slave on July 1. From the mouth of the Peace on the Slave River to Grand Detour we spent three days in travel and the rest of the week in camps under spruce along the river banks. At Grand Detour on the Slave River, July 9, we cached our canoe and hiked about ten miles west through spruce-birch-poplar forest and wet prairie country to the Little Buffalo River. Here we constructed a raft of dead spruce which carried us about 100 miles downstream to Great Slave Lake. We accomplished this in about a week,

and from the mouth of the little Buffalo hiked 16 miles along the southern shore of Great Slave Lake to Fort Resolution. 'The Prospector,' a diesel ship, was docked here on its way upstream, so we took passage on it back to Fort Smith, stopping at Grand Detour to pick up our canoe. From Fitzgerald we took the 'Radium Queen,' another diesel ship, up the Slave and Athabaska rivers to McMurray, Alberta, arriving there on July 23.

PHYSIOGRAPHY OF REGION

From Peace River, Alberta, the Peace River flows almost due north as far as Carcajou and Fort Vermilion, cutting quite deeply into the Alberta Plateau, perhaps some 200–500 feet in some areas. Along the river banks there is a small wooded area, 100–500 yards in width, between the river and the older cut, consisting of spruce, poplar, willow and alder. There are few islands in this stretch of the river, and above the river-break are extensive prairies.

At Fort Vermilion the river turns and flows eastward, dropping gradually off the Alberta Plateau to the alluvial lowlands where the Peace, Slave and Athabaska rivers meet in a low delta country of many lakes and rivulets. Many forested islands characterize this stretch of the river. Near Red River Post, navigation is interrupted by Vermilion Falls, and below this is another small rapids called Little or Boyer Rapids, which we were able to navigate because the water was at a high stage.

The Slave River, from the junction with the Peace, runs northward to Great Slave Lake. Forests border the river, and numerous wooded islands are encountered. At Fitzgerald begin about 16 miles of rapids, and one is obliged to portage to Fort Smith before continuing downstream. From Smith the Slave River flows northwestward in a rather irregular course for about 175 miles to Great Slave Lake.

The Little Buffalo River is a clear, brown-water stream a few miles west of the Slave. It runs through alluvial soil for most of its length before entering Great Slave Lake about 16 miles southwest of Fort Resolution. Mixed woods of white spruce, poplar and birch border the stream.

METHODS OF OBSERVATION

No birds were collected on our expedition as we were not equipped with shotguns nor collecting permits; however, birds mentioned were properly identified to species. From the canoe we were able to hear birds singing along the banks, and with the aid of our binoculars could observe birds flying over the river-break. We usually made

short excursions from our camp sites in the morning before continuing downstream. (*See* Text-fig. 1 for camp sites.) The numbers of birds listed in Tables 1 and 2 are mostly the actual numbers of individuals

TABLE 1

DISTRIBUTION OF DUCKS AND GEESE ALONG THE PEACE, SLAVE AND LITTLE BUFFALO RIVERS IN JUNE AND JULY

	June 15 to 30				*July 1 to 8*				*July 9 to 18*	
	Peace River				*Slave River*				*L.B.R.*	
	Peace R. Alba. to Ft. Vermilion		*Ft. Vermilion to Slave River*		*Junction with Peace River to Fitzgerald*		*Fitzgerald to Grand Detour*		*On L. B. River*	
	200 mi.		*175 mi.*		*60 mi.*		*40 mi.*		*100 mi.*	
	Ad.	*Yg.*	*Ad.*	*Yg.*	*Ad.*	*Yg.*	*Ad.*	*Yg.*	*Ad.*	*Yg.*
Canada Goose	1	1	40[1]	0	0	0	0	0	6	13
Mallard	75	0	300[2]	0	17	0	50	0	12	0
Amer. Baldpate	50	0	9	0	1	0	3	0	3	0
Green-winged Teal	0	0	0	0	0	0	6	0	0	0
Blue-winged Teal	6	0	0	0	0	0	0	0	0	0
Scaup, sp.	0	0	0	0	0	0	2	0	0	0
Amer. Golden-eye	50	13	24	7	23	0	15	0	0	0
Buffle-head	0	0	0	0	1	0	1	0	1	6
Ruddy Duck	0	0	5	0	0	0	0	0	0	0

[1] 40 flock flying upstream June 29.
[2] 300 in one flock above Vermilion Falls.

seen or heard, but some of the larger figures are estimates made at the end of each day's travel.

OBSERVATIONS

Immediately below are notes on a few species which we thought of interest, and in Tables 1 and 2 may be found a complete list of species observed.

PIED-BILLED GREBE, *Podilymbus podiceps*.—We saw two on July 8 in a slough near Grand Detour on the Slave River.

WHITE PELICAN, *Pelecanus erythrorhynchos*.—On the Peace River, 10 miles upstream from Little Rapid (Boyer Rapids), we saw two flying towards Lake Athabaska, June 28.

CANADA GOOSE, *Branta canadensis*.—We saw a flock of forty geese flying upstream over the Peace River a few miles above Little Rapid on June 29. About 40 miles upstream from Great Slave Lake, along the Little Buffalo River, on July 16, we saw a goose and gander with three young. The young were about one-fourth the size of the adult birds. When the birds saw us they 'ducked' for the bank and swam downstream close to the farther shore. One adult was leading the group, then followed the three young, and the other parent brought

TABLE 2

DISTRIBUTION OF BIRDS (EXCLUDING ANSERIFORMES) ALONG THE PEACE, SLAVE AND LITTLE BUFFALO RIVERS

	Zoogeographic Origin[1]	June 15–30 Peace R. Peace R., Alba. to Ft. Vermilion 200 mi.	June 15–30 Peace R. Ft. Vermilion to Slave R. 175 mi.	July 1–8 Slave R. Junction with Peace R. to Fitzgerald 60 mi.	July 1–8 Slave R. Fitzgerald to Grand Detour 40 mi.	July 9–18 L.B.R. On Little Buffalo River 100 mi.
Red-throated Loon	PB					1
Pied-billed Grebe	ua					2
White Pelican	ua		2			
Goshawk	ua			1		1
Sharp-shinned Hawk	ua			1		1
Red-tailed Hawk	ua		1	9		
Swainson's Hawk	ua	2				
Bald Eagle	ua	1			1	
Marsh Hawk	ua			1		
Osprey	ua					1
Duck Hawk	ua			1		2
Pigeon Hawk	ua		1			
Sparrow Hawk	ua	15	10			3
Ruffed Grouse	OW		2	10		
Sora Rail	ua		1			2
Killdeer	ua	4	5			
Wilson's Snipe	ua					1
Solitary Sandpiper	ua	4	2			4
Spotted Sandpiper	ua	150	100	50	50	35
Yellow-legs sp.	ua					1
Bonaparte's Gull	ua			10		
Arctic Tern	ua				2	
Black Tern	ua	3				
Long-eared Owl	OW				1	
Horned Owl	OW		1	5	5	4
Richardson's Owl	OW				1	4
Night Hawk	ua	75	5			
Kingfisher	OW	1		4		
Yellow-shafted Flicker	ua	5			2	
Pileated Woodpecker	ua	2	4		10	
Yellow-bellied Sapsucker	ua		2	2	2	1
Downy Woodpecker	ua		1	2	3	
Arctic Three-toed Woodpecker	ua		2			
American Three-toed Woodpecker	ua		1			
Eastern Kingbird	SA	10		5	5	
Eastern Phoebe	SA			10	1	
Yellow-bellied Flycatcher	SA		2			
Alder Flycatcher	SA	100	75	20	10	
Least Flycatcher	SA	150	85	50	20	
Olive-sided Flycatcher	SA	75	60	10	5	
Tree Swallow	OW	25	30	2	4	6
Bank Swallow	OW	50	75	50		
Cliff Swallow	OW	300	50	75		
Canada Jay	OW		6		2	5
Northern Raven	OW		3	1	7	4
Crow	OW	10				10

[1] PB—Pan-Boreal; ua—unanalyzed; OW—Old World; SA—So. Amer.; NA—No. Amer.

TABLE 2 (cont.)

	Zoogeographic Origin	June 15–30 Peace R. Peace R., Alba, to Ft. Vermilion 200 mi.	Ft. Vermilion to Slave R. 175 mi.	July 1–8 Slave R. Junction with Peace R. to Fitzgerald 60 mi.	Fitzgerald to Grand Detour 40 mi.	July 9–18 L.B.R. On Little Buffalo River 100 mi.
Black-capped Chickadee.	OW	4				
Hudsonian Chickadee...	OW				2	
Red-breasted Nuthatch..	OW	3			4	
House Wren.....	NA	15	2	1	2	
Robin.....	OW	10		10	2	
Hermit Thrush.....	OW	10		2	4	
Olive-backed Thrush....	OW			25	10	
Ruby-crowned Kinglet..	OW	3			1	
Red-eyed Vireo.....	NA	100	75	50	30	
Black and White Warbler	NA	5	10	4	2	
Tennessee Warbler.....	NA		1	100	75	
Yellow Warbler.....	NA	30	10	10	15	
Magnolia Warbler.....	NA		1		1	
Cape May Warbler.....	NA		4			
Black-throated Green Warbler.....	NA	10		2	5	
Bay-breasted Warbler...	NA				3	
Northern Water-thrush..	NA	75	15	20	30	
Western Yellow-throat..	NA	10				
American Redstart.....	NA	5	10	3	5	
Red-winged Blackbird...	SA			10	15	
Bronzed Grackle.....	SA				4	
Western Tanager.....	SA	1		10	5	1
Rose-breasted Grosbeak.	OW		4	2	4	
Purple Finch.....	OW		2	1	3	
White-winged Crossbill..	OW		30		15	
Savannah Sparrow.....	NA			1		
Vesper Sparrow.....	NA			4		
Junco.....	NA		1	2	3	
Chipping Sparrow.....	NA		5	4	6	
Clay-colored Sparrow...	NA				1	6
White-crowned Sparrow.	NA	1				
White-throated Sparrow.	NA	25			12	
Swamp Sparrow.....	NA					2
Song Sparrow.....	NA	5		5	5	

up the rear—a perfect line of file. The adult birds extended their necks and held them horizontal to, and just above, the surface of the water. A few hours later, farther downstream, we flushed this same family from the grass bordering the stream. The two adults splashed and thrashed towards us on the water, then one flew off downstream. The other flapped along the surface of the water but was not able to get into the air. The three young dived on reaching the water and were not seen again. On this same day (July 16) we saw what was probably a combination of two families of geese in one flock—four adult birds and ten young which latter were about three-fourths the size of the adults.

BUFFLE-HEAD, *Glaucionetta albeola*.—On July 14 we saw a female with a brood of six young on the Little Buffalo River about 50 miles upstream from Great Slave Lake. A family of four Great Horned Owls was annoying the ducks but apparently was unsuccessful or was not interested in capturing them as we saw the same family of ducks for the next two days just ahead of our raft on the river.

RUDDY DUCK, *Oxyura jamaicensis*.—On June 27 we saw a male in nuptial plumage (sky-blue bill, chestnut back and white cheeks) on the Peace River a few miles below Red River Post.

SWAINSON'S HAWK, *Buteo swainsoni*.—We saw this hawk twice soaring over the river-break on the Peace River between Peace River, Alberta, and Fort Vermilion during the week of June 15–21.

SPOTTED SANDPIPER, *Actitis macularia*.—We found a nest with four eggs on July 5 amongst driftwood on the shore of the Slave River about eight miles below Fort Smith.

LONG-EARED OWL, *Asio otus*.—Along the west bank of the Slave River, a few miles below Fort Smith, we saw a bird of this species perched in some alders bordering the river.

DISCUSSION OF TABLES

From a glance at Table 1 it is evident that not many ducks or geese appear on the large rivers of this region during at least part of the nesting season (June and July). The only concentration of ducks was noticed on the Peace River just above Vermilion Falls near Red River Post. This flock of about 300 Mallards appeared to be males in eclipse plumage taking advantage of the broad, quiet stretch of water above the falls. A few American Golden-eye females were seen with broods (*see* Plate 10) on the Peace and Slave rivers near the banks. The female Buffle-head with six young on the Little Buffalo was the only other duck seen which took its young to the rivers. Several female American Baldpates and Mallards were seen on the rivers, but no young. On the Peace River we saw an old goose with one gosling, and again on the Little Buffalo, three family parties were encountered.

Table 2 gives one the impression that there are fewer flycatchers, warblers and sparrows along the Little Buffalo River than along the Peace and Slave rivers. This may be the case, but also the lateness of the season must be taken into account. Perhaps similar numbers of these birds were present along the Little Buffalo River but were not singing and hence not noticed.

The typical birds along the Peace, Slave and Little Buffalo Rivers were American Baldpate (*Aythya americana*), Mallard (*Anas platy-*

rhynchos), American Golden-eye (*Glaucionetta clangula*), Spotted Sandpiper (*Actitis macularia*), Alder Flycatcher (*Empidonax traillii*), Olive-sided Flycatcher (*Nuttallornis borealis*), Least Flycatcher (*Empidonax minimus*), Red-eyed Vireo (*Vireo olivaceus*), Tennessee Warbler (*Vermivora peregrina*), Northern Water-thrush (*Seiurus noveboracensis*), and White-throated Sparrow (*Zonotrichia albicollis*).

It is interesting to analyze these data as to the zoogeographic origin of the species observed. Using Ernst Mayr's (1946) data on the probable geographic origins of North American families and subfamilies of birds, it was found that of the 89 species seen within the area under discussion, 43% were of an unanalyzed element, 19% of Pan-boreal, 23% of Old World, 23% of North American, and 10% of South American origin.

LITERATURE CITED

HARPER, FRANCIS
1925. A faunal reconnaissance in the Athabaska and Great Slave lakes region. Thesis, Cornell Univ., Ithaca, N. Y.

MAYR, ERNST
1946. History of North American bird fauna. Wilson Bull., 58 (no. 1): 1–68.

PREBLE, E. A.
1908. A biological investigation of the Athabaska-Mackenzie Region. U. S. Biol. Surv., N. A. Fauna, no. 27: 574.

SETON, E. T.
1908. Bird records from Great Slave Lake region. Auk, 25: 68–74.

SOPER, J. DEWEY
1942. The birds of Wood Buffalo Park and vicinity, northern Alberta and District of Mackenzie, N. W. T., Canada. Trans. Roy. Canad. Inst., 25 (pt. 1): 68–74.

Laboratory of Ornithology
Cornell University
Ithaca, N. Y.

OBSERVATIONS ON CERTAIN BIRDS OF THE REGION OF KODIAK, ALASKA

BY JOSEPH C. HOWELL[1]

KODIAK ISLAND lies in the Gulf of Alaska less than 100 miles south of the base of the Alaskan Peninsula. The 58th parallel, north, marks its latitude. Its greatest distance across is about 80 miles. The field work upon which this paper is based was limited to a coastal strip along the northeast shore of the island near the town of Kodiak, and bounded by Larson Bay to the northwest and Middle Bay to the south-

[1] Contribution No. 17, Department of Zoology and Entomology, University of Tennessee, Knoxville.

east. At no time did the writer reach a point more than 30 miles distant by road from Kodiak.

This portion of Kodiak Island can be described as follows. The irregular coast line is characterized by many bays and numerous points of land. Low mountains or hills are never more than a mile or two inshore from the coast. At a few places the hills run right down to the sea, and the action of the tides has cut under the hills to form cliffs that may be as much as 100 feet in height. At other places the streams have formed broad, level valleys known locally as "flats." These flats are sometimes covered by the tides for distances of a mile or so inland, and such parts of the flats are without trees. Most of these streams are wooded from their brink back to the hills that hem them in, rarely more than half a mile on each side. In late June the snow line extends down to about 1500 feet. As the majority of the mountains rise to 2000, and some to 4000, feet most of them have considerable snow on their tops. The timber grows in the valleys and on the slopes up to a height of about 800 feet. Bushes (alder and birch) rise farther up on the slopes than the trees and attain an altitude of about 1500 feet. Above the bush line the mountains are not bare of vegetation, for wherever they are free of snow there are grasses, tiny alpine flowering plants, and mosses. The mountains have steep slopes.

The streams are clear (except following prolonged rains), and at their mouths rarely exceed 100 feet in width. Some tumble abruptly into the sea, but the larger ones have extensive flood plains, or flats. These plains are sometimes a mile or more in width. Near the sea the streams tend to meander. The flats support a dense growth of green grass. Normally these flats are above the high tide mark and serve as a nesting site for Savannah Sparrows and occasionally for Least Sandpipers. Usually about a mile back from the mouth of the streams their tributaries have been dammed up by beavers, so that there are a series of small ponds. These ponds mark the farthest outpost of the willows and poplars.

The vegetation of the stream beds inland from the flats area consists of numerous thickets of poplars, alders, and willows. The poplars are the tallest, some of them attaining a height of fifty feet. The willows and alders are rarely more than 15 feet in height. As the level areas of the stream beds give way to the slopes of the hills, the vegetation changes to patches of tall, broad-leaved grass, and other patches of elder and raspberry; both of these vegetation types are often mixed. Also on the slopes are occasional thickets of a small birch, which has a dark bark, and a few viburnums. On the drier parts of the slopes are extensive areas where roses are the predominant plant. Conifers

are very scarce over most of this area, but there are a few stands of spruce on the east shore of Middle Bay and near Larson Bay. The tallest of the spruce are 70 feet in height.

Frequent field trips were taken between April 22 and July 9, 1944, when freedom from military duties permitted. The species listed are but a part of those that occur on the small section of the island which was studied. The field work was hampered by a total lack of ornithological literature, no means or permission to collect specimens, and by not having binoculars. Subspecific names have been used only where there is no species name available. The field work was carried out at, or near, a relatively few stations which are located as follows: Larson Bay, 10 miles northwest of the town of Kodiak; The Old Woman, a low mountain eight miles southeast of Kodiak; Bell's Flats, a large area of flats, almost two miles across, 12 miles southeast of Kodiak; Double Island, a quarter of a mile offshore from Bell's Flats; Happy Beach, 20 miles southeast of Kodiak; and Middle Bay, 25 miles southeast of Kodiak. These distances are all by road and are not airline distances.

Double Island was populated by a colony of a number of different species of seabirds, and to avoid the need to describe it when dealing with these species individually, a general description is given here. It was about 500 yards in length and it varied in width from 20 to 150 yards. Most of the island was about five feet above the high-tide level, but in places the edge of the island rose almost vertically from the sea to a height of 30 feet. The center of the island was comparatively open, being covered with grass, moss, and an occasional willow. Rather dense growths of raspberry, willow, and alder grew along the more elevated edges of the island.

All dates mentioned in the list of species that follows refer to the year 1944.

DOUBLE-CRESTED CORMORANT (*Phalacrocorax auritus*).—A few were seen during late April at Bell's Flats. Ten seen July 9, at Larson Bay.

MALLARD (*Anas platyrhynchos*).—Two were seen April 22, and three May 9, at Middle Bay. Three seen May 7, at Bell's Flats.

BALDPATE (*Mareca americana*).—Two were seen May 31, at Middle Bay, and one June 16, at Bell's Flats.

PINTAIL (*Anas acuta*).—Two were seen April 22, at Middle Bay, and two June 11, at Bell's Flats.

GREEN-WINGED TEAL (*Anas carolinensis*).—A male was seen May 27, and one June 13, at Bell's Flats.

GREATER SCAUP DUCK (*Aythya marila*).—From one to three were seen on six dates between June 3 and 20, at Bell's Flats.

AMERICAN GOLDEN-EYE (*Glaucionetta clangula*).—Four were seen April 30, and one May 7, at Bell's Flats.

BUFFLE-HEAD (*Glaucionetta albeola*).—Two were seen April 30, at Bell's Flats.

HARLEQUIN DUCK (*Histrionicus histrionicus*).—A pair was seen May 31, and one bird seen June 9, at Middle Bay.

PACIFIC EIDER (*Somateria v-nigra*).—Seventy-five were seen June 11, at Double Island. Twenty-five nests were examined on this island; ten held eggs and 15 contained the remains of broken eggs, or were empty. The nests containing eggs held from one to six. Foxes were responsible for most of the predation and had scattered the remains of eggs to all parts of the island. The nest sites selected varied from the high-tide mark to the highest point on the island, but most of the nests were placed on ledges. No young were observed, but some nests held eggs that were well advanced in incubation.

RED-BREASTED MERGANSER (*Mergus serrator*).—Five were seen April 30, at Bell's Flats. Later they were seen at all areas visited, and throughout the period of my stay. A nest found June 11, on Double Island, held ten slightly incubated eggs. The nest was in a rather dense patch of raspberry, 20 feet in from the edge. The nest was in a hollow excavated by the bird. It was composed of coarse dead grass and lined with much dark gray down which partially covered the eggs.

GOSHAWK (*Accipiter atricapillus*).—A nest found July 9, at Middle Bay, was 35 feet above the ground against the trunk of a spruce that was 70 feet in height. It held one large young which attempted to fly from the nest and managed to reach a point 100 feet from the nest before striking the ground. The young hawk still bore considerable down. The nest tree stood in the heart of a dense grove of spruce trees which was 10 acres in area.

AMERICAN ROUGH-LEGGED HAWK (*Buteo lagopus*).—One was seen June 9, at Middle Bay; another was seen June 10, at Bell's Flats.

BALD EAGLE (*Haliaeetus leucocephalus*).—One was seen April 22, near Middle Bay, beside a nest that was 45 feet above the ground in a poplar. An immature was seen April 30, at Bell's Flats. A pair of adults was seen July 9, at Larson Bay.

DUCK HAWK (*Falco peregrinus*).—One was seen May 23, at The Old Woman.

PTARMIGAN (*Lagopus lagopus*, or *L. rupestris*).—Four were seen May 23, at The Old Woman; two were males in white plumage, two were females in mottled brown plumage. These birds were found from an elevation of 1000 feet up to the top of all mountains visited. Three nests were found on June 25, at the top of a low mountain near Bell's Flats. All were in exposed areas which the wind had swept clear of snow, and on which small, open patches of dead grass and numerous jagged rocks provided the only cover. Below the nests stretched extensive snow fields, the larger ones being a mile or more in area. Two nests held the remains of eggs that had been destroyed by foxes. The third held eight fresh eggs.

BLACK OYSTER-CATCHER (*Haematopus bachmani*).—Five were seen July 9, at Larson Bay.

SEMIPALMATED PLOVER (*Charadrius semipalmatus*).—A nest containing three eggs was found on May 31, at Middle Bay. Two hollows which were unlined had been scooped out near by. The nest was in a small area of open gravel on a point that extended out into the bay. It was only three feet above the normal high-tide mark. On June 9, there were four eggs in the nest. An adult was seen June 11, at Bell's Flats.

WILSON'S SNIPE (*Capella gallinago*).—Two were seen May 7, and one was heard winnowing, June 25, at Bell's Flats.

GREATER YELLOW-LEGS (*Totanus melanoleucus*).—Two were seen May 9, at Middle Bay.

LEAST SANDPIPER (*Erolia minutilla*).—Four were seen May 9; five, May 31; three, June 9; and three, July 7, at Middle Bay. One of the three seen on July 9 flew like an immature bird. One was seen June 13, at Bell's Flats.

GLAUCOUS-WINGED GULL (*Larus glaucescens*).—Ten were seen May 7, at Bell's Flats; 200 on June 11, at Double Island; 100 on July 7, at Middle Bay; and 100 on July 9, at Larson Bay. A colony of 100 pairs was examined on Double Island on June 11. Most of the nests were placed on ledges of the low cliffs along the edges of the island. About half of the nests held eggs, usually two or three, but one nest held four. No young were observed.

PACIFIC KITTIWAKE (*Rissa tridactyla*).—A colony of 250 pairs was examined on Double Island on June 11. The nests were placed on the level, grassy, central area of the island. Many nests were empty, but the majority held two or three eggs. The closest nests were three feet apart.

ARCTIC TERN (*Sterna paradisaea*).—Three were seen offshore from The Old Woman, on May 19. A colony of 100 pairs was found on Double Island on June 11. The nests were scattered over most of the island in isolated groups of two to thirty nests. A few nests were in the debris which marked the high-tide limit, but most were in the low-lying center of the island. Many of the nests were in rather dense grass that was a foot and a half in height. A number of the nests were empty, or held a single egg; the majority held two eggs, and only four nests held three eggs. No young were seen. The nests were always at least three feet apart.

ALEUTIAN TERN (*Sterna aleutica*).—A colony of 50 pairs was nesting on Double Island on June 11. The observations recorded under the Arctic Tern apply also to this species. A number of individual nests of this species were singled out for observation and no constant differences were noted. No tendency for either species to become segregated from the other was observed; the nests of the two species were often no more than three feet apart. The scolding notes of the two terns are quite distinctive; that of this species is rolling and less harsh than the sustained note of the Arctic Tern. Both species of tern had their nests among those of the Pacific Kittiwake. Foxes had broken the eggs in many of the tern nests. One adult of this species was found dead beside a nest that had been broken up.

PIGEON GUILLEMOT (*Cepphus columba*).—Two were seen June 9, at Middle Bay; 10 were seen June 11, at Happy Beach; 15 on June 11, at Double Island; and 15 on July 9, at Larson Bay.

AMERICAN HAWK OWL (*Surnia ulula*).—A female was shot by a serviceman on June 6, at Bell's Flats. It had three yolks in the ovary enlarged to an eighth of an inch in diameter.

BELTED KINGFISHER (*Megaceryle alcyon*).—One was seen May 31, at Middle Bay. A single bird was seen June 3, 6, 10, and 19, at Bell's Flats.

DOWNY WOODPECKER (*Dendrocopos pubescens*).—Two were seen April 30, at Bell's Flats; one was seen May 9, at Middle Bay; five were seen June 13, at Bell's Flats. A nest containing one fresh egg was found June 13, at Bell's Flats. It was 15 feet up in the dead top of a poplar.

VIOLET-GREEN SWALLOW (*Tachycineta thalassina*).—Five were seen May 9, at Middle Bay; one pair was seen to drive a chickadee from a nest cavity in which the chickadee had an almost completed nest. This swallow was seen in numbers up to 15 individuals at all localities visited.

AMERICAN MAGPIE (*Pica pica*).—A common species in all of the wooded valleys. A nest containing four fresh eggs, and another nest just completed but empty, were found at Bell's Flats on April 30. A nest containing five eggs was found at The Old Woman on May 23.

RAVEN (*Corvus corax*).—From five to twenty individuals were seen almost daily. They were seen at all localities visited and frequented all types of habitats from the rocky beaches to the tops of the snow-covered mountains. Two young ravens were seen on June 16, 50 feet up on the face of a cliff that rose 75 feet above the sea at Happy Beach. The young were not observed to fly and it is probable that they were from a nest on this cliff. This species was not particularly wary here.

NORTHWESTERN CROW (*Corvus brachyrhynchos caurinus*).—Fifteen were seen April 22, at Middle Bay; one was seen June 27, at The Old Woman; 10 were seen July 9, at Larson Bay.

BLACK-CAPPED CHICKADEE (*Parus atricapillus*).—Seen in small numbers in all of the wooded valleys visited. One was flushed from a nest cavity it was excavating in a poplar at Bell's Flats on May 7. A nest, almost completed, was found at Middle Bay on May 9. A nest containing nine fresh eggs was found 15 feet up in a cavity in the dead top of a poplar at Bell's Flats on June 3. Another nest containing nine eggs was found at Bell's Flats on June 13.

BROWN CREEPER (*Certhia familiaris*).—Two were seen at Bell's Flats on June 13.

VARIED THRUSH (*Ixoreus naevius*).—Two were seen on June 9, and four on July 7, at Middle Bay; two were seen June 13, and one was heard July 5, at Bell's Flats; five were seen July 9, at Larson Bay.

HERMIT THRUSH (*Hylocichla guttata*).—A common species which occurred in the valleys and on the slopes of the mountains up to 1500 feet. One was heard in full song at Bell's Flats on April 30. Two nests were found at Bell's Flats on June 8; both held four eggs, one set being a week advanced in incubation; the other was further advanced. A nest found at Middle Bay on June 9 was four feet up in a small spruce and held three heavily incubated eggs. A nest containing four eggs was found at Bell's Flats on June 10, another with four eggs on June 13, and a nest with five eggs on July 4.

AMERICAN PIPIT (*Anthus spinoletta*).—Frequently seen on the open, grassy slopes of the mountains above 1500 feet. The first observed were three seen at The Old Woman on May 23. A nest containing four eggs, which had been incubated about a week, was found at The Old Woman on June 17. The nest was 100 feet down from the crest of the mountain on a rather steep slope which was covered by a dense mat of dead grass. The nest rested in a cavity of sufficient depth to place the rim of of the nest flush with the ground.

ORANGE-CROWNED WARBLER (*Vermivora celata*).—Sparsely, but regularly, distributed in the wooded valleys. None were positively identified until June 8, but it then became evident that their song had been heard earlier.

YELLOW WARBLER (*Dendroica petechia*).—A common species, evenly distributed throughout the valleys and on the slopes of the mountains up to 1500 feet. It was first identified on June 8. Four nests were found; all were in elder bushes. A nest holding four fresh eggs was found at Bell's Flats on June 19; later a fifth egg was laid. A nest containing three young about seven days old was found at Bell's Flats on July 4.

PILEOLATED WARBLER (*Wilsonia pusilla*).—The most numerous warbler. It was found in the valleys and on the slopes of the mountains up to 1500 feet. The habitat having the densest population was one in which areas of coarse green grass and thickets of raspberry, alder, and elder were interspersed. The species was first noted on June 3, when eight were seen at Bell's Flats. As many as 30 were seen in six hours in the field.

PINE GROSBEAK (*Pinicola enucleator*).—Most of the individuals were seen at

Middle Bay and Larson Bay, where there were stands of spruce, but some were seen in valleys where only deciduous trees (largely poplar and willow) grew. On June 9, at Middle Bay, a nest containing three fresh eggs was found. The nest was four feet above the ground in a small spruce. On July 7, at Middle Bay, both members of a pair were seen on the ground, each with nest material in its bill.

REDPOLL (*Acanthis flammea*).—Frequently encountered in the valleys and on the slopes of the mountains up to about 1500 feet. Five were seen at Bell's Flats on June 3. A nest containing four eggs about one week incubated was found at Bell's Flats on June 19. The nest was three feet up in an elder bush which stood in the heart of a dense patch of raspberry bushes.

SAVANNAH SPARROW (*Passerculus sandwichensis*).—Common in the moist, grassy areas, both in the valleys and on the slopes of the mountains up to about 1500 feet. The first recorded were three (all in song) at Middle Bay on May 9. A nest containing five fresh eggs was found at Middle Bay on June 9. The nest was in a tussock of grass in an open, swampy area over which stood a few inches of water. A nest holding four eggs that were about half incubated was found on a slope of The Old Woman on June 17. The nest was in an open growth of grass and moss at an elevation of about 1500 feet.

WHITE-CROWNED SPARROW (*Zonotrichia leucophrys*).—Common in the valleys and on the slopes of the mountains up to 1500 feet. Ten were heard singing at The Old Woman on May 23. A nest found on June 10 was just below the snow line on a slope of a mountain above Bell's Flats. The nest held five eggs which were far advanced in incubation. A nest containing four eggs was found on June 13, and another containing five eggs was found on June 19, both at Bell's Flats.

SONG SPARROW (*Melospiza melodia*).—This was the commonest species of land bird. It occurred in most of the habitats of the valleys and on the slopes of the mountains up to 1500 feet. The species was first noted on April 30, when five were seen (some were in song) at Bell's Flats. Eight nests were examined between May 31 and July 4. Three nests held five eggs, two held four eggs, one held three eggs, and two held young. All of the nests were on the ground. The earliest clutch of four was completed about May 20.

SNOW BUNTING (*Plectrophenax nivalis*).—Seen only on the top of a mountain near Bell's Flats. Here ten were seen on June 25. They were above the snow line near the crest of the mountain at an elevation of about 2500 feet. Numerous bare areas in the extensive snow fields were overgrown by low grass. In one of these a nest was found which contained five young three days old. The nest was in a crevice in some rocks that was too small to admit my hand until some overhanging moss was removed.

University of Tennessee
Knoxville
Tennessee

BARN OWL GROWTH AND BEHAVIORISMS

BY GAYLE PICKWELL

Plate 11

THE first Barn Owl (*Tyto alba pratincola*) the author ever saw was one that was shot by a neighbor in eastern Nebraska, and the author at the time, at the height of his taxidermy urge, was asked to mount it. He did mount it and for many years it was maintained proudly on its pedestal in the living room of the neighbor.

In central California in the region of San Jose the author was later to learn that Barn Owls are common. At night in all California cities the peculiar scream of the Barn Owl, as it flies here and there after nightfall from its daytime retreat, is one of the most frequent and certainly most eerie of night sounds. This sound has been heard in most large cities of the Far West.

The species nests in many localities. A significant crevice, even in a dirt bank made by the construction of highways, often suffices. In the region of San Jose, California, the bird frequently uses cavities in the immense live oaks (*Quercus agrifolia*). Two such nests have been recorded. Others have been reported in lofts of barns. One of the most surprising was a nest made in an inexplicable cavity on the side of a large stack of hay about nine miles from Los Banos in the San Joaquin Valley. This nest was discovered on May 29, 1929. On San Jose State College campus, these owls nested habitually in the casements below the windows of a high campus tower, and janitors told the author that these casements had been used as nest sites for many years.

As later records will show, the Barn Owl is one of the most effective catchers of pocket gophers (*Thomomys*). Its method of hunting is described in my notes made on April 30, 1931: " . . . Two or three Barn Owls were seen hunting over the hay meadows in the region of Evergreen in the dusk. They flew back and forth, 'stood' about 30–40 feet in the air—and dropped precipitously."

The parent owl often persists in sitting near her young and will not leave them, even when disturbed. Such a record was made on April 30, 1931, at Evergreen California, and much later (May 6, 1939) a parent owl allowed herself to be photographed in rampant pose with her six young in a south casement of the college tower. On May 16 it was noted that, of the several young in this nest, the largest was fully twice the size of the smallest. This observation was made also of the young of the nest which was critically followed.

One of the nests of the college tower was followed carefully in 1928 throughout the full life history of the resultant young. The nest in the westernmost of these casements (a casement which measured 28″ by 8′ inside, with a depth of 3′ 8″) had seven eggs on February 25. These were of the usual owl-egg coloring—dead white—and strikingly oval in shape. One of the seven eggs hatched on March 12. The following record was made at the time:

" . . . One owl hatched, egg shells by side of nest, six eggs yet Young very weak and helpless. Could not raise head. Said 'peep however. Female (?) went off reluctantly—alighted on box and then away to same tree west. Two photos of nest. While at work, owl came in, alighted on side of building, and away again. No notes."

Another young did not hatch until March 19, seven days later; and on March 21 a third hatched. On March 22, the fourth egg was pipped and the young was squeaking inside, and on March 23 this fourth hatched. Since these young owls were weighed carefully every day, it was learned that this fourth chick at hatching was appreciably less in weight than the egg from which it emerged. The egg had weighed 21.7 grams and the young owl weighed 17.9 grams. Since this newly hatched young had had no opportunity to eat, this lessening could be easily explained by the loss of the weight of the egg shell and the drying that accompanies hatching.

On March 24, the following day, another egg with a young owl peeping inside weighed 21.8 grams. This egg hatched on March 25; the chick weighed 21.2 grams. This newly hatched bird squeaked as loudly as those hatched earlier.

On March 27 the records state the following with regard to the sixth owl: " . . . Weight 18.5 grams. This one could not be measured for it was just out of the shell and had not straightened out as yet."

The seventh Barn Owl egg apparently was addled, for it produced no young.

The six young owls had been hatched over a period of 15 days. The intervals between hatchings had been irregular—seven days between the first and second and at two-day intervals for the remainder. This irregularity in the hatching of the young Barn Owls indicated that the parent had begun to incubate perhaps as soon as the first egg had been laid and continued to sit and lay eggs for some time thereafter. This not only caused a striking differential in the ages of the young but also resulted in striking differences in their sizes (*see* Table 1).

The egg tooth on the bill of the first Barn Owl persisted for several

(*Upper*) PARENT BARN OWL IN PROTECTIVE POSE ABOVE THE YOUNG. (*Lower*) PARENT WITH POCKET GOPHER, AND YOUNG OWLS NOS. 1 AND 2 (SEE TEXT).

TABLE 1

WEIGHTS AND LENGTHS OF YOUNG BARN OWLS AND WEIGHTS OF EGGS
FROM MARCH 20, 1928 TO APRIL 3, 1928

Date	*Weight (grams)*							*Length (millimeters)*						
	No. 1	*No. 2*	*No. 3*	*No. 4*	*No. 5*	*No. 6*	*No. 7*	*No. 1*	*No. 2*	*No. 3*	*No. 4*	*No. 5*	*No. 6*	*No. 7*
March 20	101.5	41.0	*N. R.*	*23.0*	*N. R.*	*22.0*	*N. R.*	155	112	N. R.	N. R.	N. R.	N. R.	N. R.
21	127.0	54.0	22.0	*23.0*	*21.0*	*22.0*	*21.9*	160	115	88	N. R.	N. R.	N. R.	N. R.
22	135.0	66.0	26.5	*23.0*	*21.0*	*22.0*	*21.7*	169	131	92	N. R.	N. R.	N. R.	N. R.
23	149.0	79.4	31.2	*23.2*	*21.1*	*22.0*	17.9	172	130	97	N. R.	N. R.	N. R.	85
24	170.5	104.5	42.3	eggs muddy			20.0	181	140	117	N. R.	N. R.	N. R.	87
25	191.9	114.2	51.5	eggs muddy			23.7	190	150	115	N. R.	N. R.	N. R.	91
26	231.0	139.1	62.4	addled	20.0	*22.3*	30.0	195	160	125	addled	85	N. R.	97
27	231.2	147.2	70.8	egg	19.4	18.5	31.0	201	160	126	egg	85	N. R.	100
28	244.6[1]	169.2	68.7		lost	lost	lost	210	165	125		lost	lost	lost
29	255.0	171.0	67.7					215	173	135				
30	312.0	200.0	92.0					218	190	140				
31	329.7	222.6	111.2					233	195	144				
April 1	364.1	238.2	133.0					240	200	154				
2	348.4	N. R.	145.7					230	205	163				
3	365.0	260.0	Dead, about half eaten					242	205	Dead, about half eaten				

Weights of eggs are in italics

N. R. = No record.

[1] After swallowing gopher, 277.3 grams.

days. It was still in evidence on March 25, 13 days after the young had hatched.

From the beginning, the parent owls placed dead pocket gophers (*Thomomys*) in the nest beside the young. This behavior persisted for many weeks. In the end of the casement where the seven eggs had been placed there was no nesting material of any sort, but the pellets of the adults and the young made there a rather extensive mat of fur of this mammal.

To the confessed chagrin of the author, pellets of the owls were not collected daily until April 29, but from this date until May 24 they were carefully collected and their contents examined. That examination gave the following results, showing the food that the young were fed, as well as that which may have been regurgitated by the parents. From April 29 to May 24: 43 pellets—36 pocket gophers (*Thomomys*), 16 meadow mice (*Microtus*), and one mole (*Scapanus*).

On March 28, three of the six young were not present in the casement. It was impossible for them to have gotten out, and so it was presumed that the persistent rain during the latter part of March, attended by cold weather, had reduced these infant owls to hapless, inert masses. There was no indication as to their fate, whether they had been eaten by the older nestlings or by the parents. Certain it is that they disappeared utterly. My notes, made on March 28, show some of the speculations concerning their fate:

"The cold wet weather may have contributed to the early demise of the three young; undoubtedly they were eaten by the other young or old, possibly after they became stiff from chilling while the parent hunted. The weight of the remaining young today scarcely indicates that they ate these young, or all of them." (*See* Table 1.) Such increase in weight as Nos. 1 and 2 displayed could have been caused by eating additional pocket gophers, and since No. 3 definitely decreased in weight, it was eliminated as a suspect.

On March 28 nestling No. 1, the largest of the nestling owls, gave an amazing exhibition by seizing one of the three pocket gophers, which were lying on the floor of the casement, and swallowing it. My records of this observation made at the time are given here:

"After weighing, No. 1 was replaced in the casement, and it seized head first one of the three gophers lying by the nest and succeeded in swallowing it *entire* after a struggle that lasted at least five minutes, possibly more. The nestling stretched its mouth about the gopher, and for a time made swallowing maneuvers while the gopher was on the floor of the casement; when the gopher was approximately half down, it was lifted up. The nestling, attempting to swallow, would

make desperate swallowing efforts for a moment, lifting the wings and flopping them with each hard, noisy gulp; then it rested for a moment before the next trial. When the gopher was down the rodent—too long by far to get into the stomach—bulged out the neck like an immense goiter. If we had not seen it done, we would have been positive that no bird could swallow one-seventh of its weight at one mouthful. Another gopher weighed 50.9 grams. Three gophers were by the nest; one was swallowed." The weight of this largest nestling owl before swallowing the gopher had been 244.6 grams; after the meal its weight was 277.3 grams.

Various interruptions that seemed to prevent the brooding of the young Barn Owls allowed the smallest of the remaining three to become very weak and cold. On April 3 it was dead and partially eaten. It would seem that its inert condition led the parent owls to attempt to feed it, or portions of it, to the remaining young, Nos. 1 and 2.

Up to the end of March the reactions of nestlings Nos. 1 and 2 consisted chiefly of a quavering squeal, but on March 31 an additional reaction was presented. On this date, No. 1 gave for the first time an intimidation display, directed toward the observer. My notes of this date are as follows:

" . . . No. 1 gives defense reaction, spreads out, backs off, snaps its bill; no squeaking unless abused, then becomes childish again; swings from side to side with wings adroop in defense (or intimidating pose) . . . "

On the following day these notes were made: "April 1 . . . No. 1 does not squeal under any circumstance, no hiss today; backs off, fluffs up, droops wings, no beak snapping."

The reason for the very poor vision of the young owls was strikingly apparent because the lens showed a milky color; it was not to become sharp and clear for a long period.

On April 3 the reactions of Barn Owl No. 1 were recorded as follows: "Hisses a little and bites, though not viciously. Still squeals when handled roughly. The squeal is a quaver."

On April 4, nestling No. 1 was photographed on the scales that were used for weighing. It would still allow itself to be handled while being weighed. It rested on the full length of the tarsus, a position that was maintained for a long time. On this date, apparatus was taken to the top of the tower in an attempt to photograph the adults. This experience was of striking interest. The records made at the time are given herewith:

" . . . Later (8:30–10:00 p.m.) attempt made to secure flashlights of parent birds was futile. Approached window about 8:30 p.m.

and noted parent bird alight on casement with mammal in its bill (very probably a gopher). A canvas blind, open at top, was placed between young and myself. With apparatus set up we waited thirty minutes. Suddenly a most terrifying scream broke out immediately overhead. (It seemed not over a foot away.) In the dark and quiet it was blood-curdling. This scream was repeated many times with a pause of about 30 seconds of absolute quiet between.

"Finally tiring of it, I arose and observed the parent owls standing, in the full moonlight, like graven statuettes or gargoyles, each atop one of the two columns on either face of the tower. When I moved they snapped bills viciously, arose and flew about for a moment like wraiths. A helper put an old door out to cover me, but the parent birds would not come in; apparently they did not return.

"Four and a half gophers were by the nest (one had been in the mouth of a parent also). And the smaller of the two [young] owls was induced to swallow the part gopher. Flashlights of this were unsuccessful, and we left with the young one still trying. At night the young birds hissed terrifically each time we moved; much more so than in the day. The younger squealed much and tried to hover or be hovered by the older. This older would not accept food from us. It had been fed, for its bill and face were bloody."

Another attempt was made to photograph the adult Barn Owl as it came in with food for the young. This attempt was successful as the following notes attest: "April 5, 7:15 p.m. Parents not observed when nest approached. . . Young hissed only when window opened. Both squealed some after being handled. Parent came into casement while I was measuring No. 2. Had replaced No. 1. Scream of old owls is a high-pitched, rasping *kraaack*. Have another note as they fly about: a clicking or clucking sound, like a very loud cricket, *keet, keet, keet, keet,* uttered very rapidly.

"Had flashlight apparatus set up by 8:00 p.m. Covered myself with canvas. Parent bird hit plank above my head with resounding thud, alighted again farther out on casement and after a minute's hesitation dropped down beside young. She had a large gopher in her bill. The flash blinded her. She blundered about the casement for some time. Landed on me and I put my hand on her for a moment. Finally she hit the opening and left. No note again from owls until 8:30, then a scream (young are perfectly quiet for some time after a scream) from a tower pillar. From this time to 9:15 when I left, parent birds heard screaming or clucking frequently, but they did not alight on casement. One gopher by nest at 7:00 p.m. One other brought in. I could not induce either of young to eat. No. 2 still squeals much. Both hissed when I moved."

The notes secured on April 8 had several items of interest:

"April 8, 6:25 p.m. . . . Parent bird flew off nest as I approached window. . . . Monkey face [of No. 1] beginning to show up. Caused by unsheathing of feathers about upper edge and rear of disc. Can stand full length of leg now; walks on its feet instead of on tarsus as does No. 2. Walks about rather easily. . . . Old bird noted flying about and screaming. Young hiss more tonight; snap bill, bite finger (mildly), squealing now after being replaced, struggle when hung up by neck for measuring.

"Set up flash at 7:00 p.m. Parent bird landed on casement at 7:15, gave a peculiar cluck, looked about, and flew away. At 7:30 p.m. parent bird came again, stared hard into my blind for a moment and alighted by young. No food in her bill. Flash blinded her (?) as before, but she clambered up the camera's blind and was out in a moment or two. At 8:00 p.m. parent bird screamed from the pillar back of me and one is now (8:20) flying about over the campus yelling a *skree-ak* —a peculiar rasp. Young still squeal, but older is learning to click and to scream (not much like parent yet), and other tries to. They are quiet for some time after a scream from parent. No gophers or other food."

The story of the nestling owls, especially as it is related to their advanced development, was significant in the notes made on April 9: " . . . Young owls seem to be almost blind yet; lens still milky; No. 1 walks sedately now, but blunders into everything. Practically no squealing when handled tonight."

On April 10, the nestling owls were able to bite severely, and both were able to use their claws. These additional notes were made concerning the young: " . . . Very little squealing now, either when handled or when quiet in the casement. Instead the rasping *kră-ă-ă* becoming more pronounced (squeal a quavering *squēē-ēē-ēē*, high-pitched)."

A pellet was discharged by young Barn Owl No. 1 on April 11. This pellet weighed 33 grams. Shortly after the pellet was regurgitated this young owl defecated. The combination of pellet plus defecation resulted in a great lessening of weight which was 511 grams beforehand and 472 afterward. The weight of nestling No. 2 on this date was 402 grams, a difference of 70 grams between it and No. 1. On this date, too, the young owls had advanced in behavior so that they were now fighting violently. Their behavior was such that on April 12 the following notes were made: " . . . Young hiss and fight viciously with claw and beak . . . No 1 very difficult to weigh now; starts at every motion on my part . . . No. 2 is difficult to

weigh but easier than No. 1. . . . Two whole gophers by nest . . . *sgree, skee, skee, ee, ee, skee, eee, ee,* squeal of young."

On April 13, in order to reduce the young Barn Owls to a condition in which they could be handled, they were placed in a sack. A slightly different voice from that of the parents was noted on this date, also, as the record herewith shows: " . . . After about 30 minutes heard soft *kra-ak* (much like that of young, not a scream) from s. pillar. This a new note. Young immediately set up a loud squealing. This note repeated frequently and softly and while it was being uttered an owl landed on n. edge of casement." (Therefore both owls must have been in and one gave food call.)

On April 15, the record shows this advance in the case of the two young owls: " . . . No. 1 hissed and screamed while in hand first time. Scream as loud and violent as that of adult. Down on breast very heavy and long; a little shedding from neck. Can run quite rapidly. Assumes defense attitude . . . No. 2 squealed a little while being returned to nest. Cannot yet stand on toes; uses full tarsus almost exclusively. Young shed considerable down while being handled. No. 1 shows considerable coloring of adult now; tail, wing, neck, upper portions of facial disc."

On April 17, the following note was made: "Injured leg of smaller owl in some fashion (slightly); bound in it splints."

April 19: " . . . No. 2 can stand upright; splint still on leg and holding. Leg a little swollen but in use otherwise. . . . " In spite of daily handling, the young owls seemed to go forward in their psychological development, as can be seen in the following notes of the same date: " . . . No. 1 scuttled off into corner as before, where he stands and hisses . . . assumes defense or intimidating posture . . . screams in hand, hisses, spreads, and springs at one when approached. Bites very hard."

On April 21, No. 1 weighed 564 grams, but on April 22 it weighed only 548 grams. The reason for this loss of weight is not readily explainable. At the same time, however, owl No. 2 showed a material increase in weight, so that on this date it weighed more than owl No.1, which was seven days older (*see* Table 2). On this same date, however, the facial disc on No. 1 was almost white.

The difference in weights was not maintained for on the following day they had re-established the prevailing differential. This condition made No. 1 nine grams heavier.

On April 24 the following incidental note was recorded for Barn Owl No. 1: "Down shedding rapidly from back. Jumps at one!!"

On April 25 No. 2 was again heavier than the older No. 1 by 13.5

TABLE 2

WEIGHTS AND LENGTHS OF BARN OWLS NO. 1 AND NO. 2
FROM APRIL 4, 1928 TO MAY 25, 1928

Date		Barn Owl No. 1		Barn Owl No. 2		Date		Barn Owl No. 1		Barn Owl No. 2	
		Weight (grams)	Length (mm.)	Weight (grams)	Length (mm.)			Weight (grams)	Length (mm.)	Weight (grams)	Length (mm.)
April	4	353.6	245	250.0	205	May	1	584.3	367	650.3	340
	5	405.8	247	320.0	215		2	570.0	370	563.0	345
	6	408.8	260	317.3	323		3	565.5	371	557.5	350
	7	N. R.	N. R.	N. R.	N. R.		4	581.8	372	609.3	345
	8	445.0	260	343.6	240		5	559.5	375	562.0	353
	9	456.0	265	362.7	245		6	544.0	376	569.2	360
	10	456.0	265	446.7	250		7	578.0	381	585.0	360
	11	511.0[1]	274	402.0	257		8	567.0	380	584.0	360
	12	489.4	275	439.1	270		9	545.0	386	588.0	370
	13	527.7	280	484.5	260		10	541.0	385	578.0	367
	14	513.8	285	485.1	260		11	559.5	391	615.0	370
	15	528.0	290	488.8	268		12	545.0	395	589.0	376
	16	535.5	292	496.8	270		13	Flew as observer entered casement		576.0	380
	17	581.0	300	481.5	270						
	18	N. R.	N. R.	N. R.	N. R.		14	Still absent		551.0	380
	19	531.5	308	486.7	280		15	529.0	392	634.0	383
	20	560.5	320	521.5	293		16	543.0	395	589.0	384
	21	564.0	320	535.5	285		17	573.0	395	564.0	385
	22	548.0	332	554.0	293		18	Not in casement		549.0	383
	23	554.5	339	545.5	308		19	Not in casement		551.0	385
	24	565.5	340	557.5	N. R.		20	Not in casement		517.5	390
	25	562.5	345	576.0	320		21	Not in casement		541.0	390
	26	592.3	347	562.5	325		22	Not in casement		541.0	401
	27	608.0	347	562.0	325		23	Not in casement		555.0	393
	28	588.5	352	534.0	326		24	Not in casement		569.0	403
	29	586.0	357	575.0	336		25	Not in casement		Not in casement	
	30	585.0	360	568.5	335						

N. R. = No record.

[1] 427 grams after disgorging pellet.

grams. On the following day (April 26) No. 1, the older owl, was again much heavier than No. 2, to the extent of 29.8 grams.

On April 27 the following records concerning the plumage and behaviorism of the young owls were made: " . . . Down on breast of No. 1 shedding rapidly. Fights viciously, rushes at annoyer, throws self on back with claws up. Still squeals when tightly held; still a youngster thus." In spite of the fact that by April 27 both young owls were walking on their toes, they still presented large callosities on the heels of the tarsi, this because of their early activities in walking about on the full length of the tarsus.

On April 29 there were several notes of interest, especially those regarding the apparent vomit nausea of a young owl attendant upon the regurgitation of a pellet. The notes for this date follow:

"April 29, 6:00 p.m. . . . One photo of young in casement. Both young hiss and both sway head and body from side to side. They have done this for some time. Loose pellet material of casement all collected and sacked. It is difficult now to tell what material belongs to this nesting. Too bad it wasn't done long ago.

"No. 2 just threw up a small pellet, made a peculiar creaking sound just before dropping it, afterward dropped head down and swung it back and forth as if with an uncomfortable feeling in neck. No. 2 (quite sure) just threw up second pellet. The head swinging a preliminary, no doubt. This second much larger than other. Small pellet, 7 grams, large pellet, 13 grams. Both well enclosed in mucous.

"No. 1 weighed 586 grams. . . . Screamed loudly, fought viciously except when head concealed, caught himself on his wings when dropped back into casement, now snapping bill. Only one or two small tufts of down on back; dorsal surface of wings clear; venter still heavily downed.

"No. 2 weighed 575 grams. . . . Screamed for first time while removing tape from leg. Leg is in bad way with broken bone nearly piercing one side. . . . Squealed a little when placed back in nest."

In weighing the young owls, they were at first placed in a sack and later were wrapped in a long black cloth to facilitate handling. The weight of these articles was of course subtracted from final weights of the owls. A record made on May 2 indicated that No. 1 reacted strongly to the black cloth. On May 8 the young owls displayed a striking differential reaction to cloths of different colors. On this date they struck at the black cloth and ignored the white.

The fluctuations in weight of No. 1 and No. 2 were quite striking. Though No. 1 was the older and usually weighed more than No. 2, there were several exceptional periods wherein No. 2 weighed more

than No. 1 as on May 4. No. 2 remained heavier than No. 1 for several days thereafter.

On May 12 the following record was made concerning the facial discs and behaviorisms of the young owls: ". . . Facial disc [of No.1] now extends beyond tip of bill. Facial disc almost white; that of No. 2 strangely ruddy or cinnamon . . . No. 1 squealed when held tightly; screamed when unwrapping . . . No. 2 fights and bites with tremendous violence, much more than No. 1. No sounds except slight squealing when tightly held; squeals considerably when returned to casement. Parents not observed."

On May 13, No. 1 flew for the first time. My records on this significant date are given as follows:

"7:30 p.m. . . . No gophers; two pellets. . . . Down [of No. 2] shedding rapidly from belly; few scraps on back; considerable on thighs. Facial disc extends 2 mm. beyond bill. Old owl flying about with food call, *krēē-ēēk, krēē-ēēk, krēēk, krēēk, krēēk, krēēk, krēēk.* (Last fast.) No 2 is responding with a peculiar rasping, regular *krăăk, krăăk, krăăk,* about a second between each. This call low, not shrill. Call may be a slow *krēē-ēēk.*

"No. 1 was standing on edge of casement when we arrived, faced us, spread wings. A moment later very softly dropped to a ledge ten feet below; after a moment there turned about and flew softly and skillfully away as if an expert. Flew out of sight around the tower."

On this date, as the records prove, it had not been possible to weigh No. 1. The weight of No. 2, however, was secured. It weighed 576 grams—considerably less than on the earlier date of May 4. Though No. 1 had left on May 13, visits were continued to the tower for some time thereafter. On May 15 the following record was made, for No. 1 had returned:

"8:15 p.m. . . . Parent owls noted flying about campus prior to visiting casement. One gopher (probably brought in by owl noted). No. 2 on war path, runs, fights, screams in handling. . . Ran rapidly tonight. Screamed more than usual but was quiet while being measured. Old bird '*kreek, kreeked*' while measuring . . . No. 1 had a little down around base of tail, none other. Very trim—a beautiful bird. Legs evidently growing in length. . . . An assistant heard an owl in north window casement; upon investigation No. 1 found there. This casement very narrow, and No. 1 may have experienced difficulty in getting out of it. No 1 hissed when viewed and struck viciously when caught, but made no other sounds. This evidence of grown-up bird perhaps. Took it to office and banded it—then released it from office window. It went off soberly and deliberately."

Though No. 1 had been released some several hundred yards from the nest site, it had returned to the casement on May 16. On that date the following record and notes were made:

"6:45 p.m. . . . No. 1 in casement. No. 1 appeared with No. 2. Three pellets; two gophers in south end of casement . . . No. 1 . . . screamed and hissed in casement and while handling, otherwise very much as before leaving nest. When placed back on window sill jumped back to casement instead . . . No. 2 . . . no sounds—squealed when returned to casement. Parents not observed."

On May 20 No. 2 made the first effort to fly. On this date, too, this young owl (as did owl No. 1 on May 12) showed a surprising loss of weight, for it now weighed only 517.5 grams. This was a striking loss of weight in the young owls just at the time of flying. However, in the case of owl No. 2 there was a slight regain of this lost weight, for on May 22 the record shows that it weighed 541 grams. This was also its weight on May 21.

On May 22 the food call of the young owl was noted and tabulated. The record is as follows:

" . . . A moment after No. 2 returned to casement, parent screamed. No. 2 immediately set up the persistent food call: '*creep*' or '*zeep*' or '*tzeep*,' very rasping, about one second interval when going at maximum. Two birds seen flying about. Heard food call of No. 1 but could not locate him in either north or south casement. Placed No. 2 on edge of casement; teetered for a moment and nearly fell off. Looked about for a time and finally jumped back into casement beside me."

Again on May 25 this striking food call was noted as given "49 times in one minute," and on May 30 the call was given "28 times in one minute."

On May 23 and 24, Barn Owl No. 2 showed an additional increase in weight. May 24 was the last time this owl was weighed. It was on this date 66 days old. On the day No. 1 flew it had been 62 days old.

On March 12, 1929, an injured adult Barn Owl was captured. The bird weighed 602 grams. This weight of an adult owl makes an interesting comparison with the weights of the two nestling Owls on the days their last weights were taken. Nestling No. 1 weighed, at the time it was last weighed (May 15), 529 grams, and No. 2 at its last weighing (May 24) weighed 569 grams. There was no way to learn whether or not the adult owl had experienced a loss in weight and partial recovery toward the end of its nestling life, as had been true of nestlings Nos. 1 and 2.

Nestling No. 1 weighed 608 grams on April 27. On every weighing subsequent to that date it gave a reading of less than 600 grams. No. 2, however, weighed 650.3 grams on May 1. This young owl had lessened in weight about 100 grams the following day, when it weighed 563 grams. On the 4th of May this owl again weighed more than 600 grams. For several days following this, No. 2 showed a marked decrease in weight, but on May 11 it again topped 600 grams. The owl then decreased in weight for several days, but again on May 15 it gave the surprising record of 634 grams. From May 15 until the last weighing of this owl on May 24, there was then a constant though somewhat erratic decrease in weight, and on the last weighing the owl recorded 569 grams.

In addition to daily weighings of the young Barn Owls from their hatching until they left the nest, measurements were made of total length, of facial disc, wing lengths, and lengths of primary feathers. In addition to the measurements there were careful records of the increase in length of nestling down, colors of this down, and shedding of the down as the contour feathers pushed it out.

The food-begging of the young owls was heard in the vicinity of the tower or the near-by palm trees for several days after they had made their initial flights, and on June 17 there was an astonishing combat observed in the air. The records made for this day follow:

"Three owls noted about tower; considerable screaming. Once or twice aerial battles occurred and pair tumbled down for many feet. Don't understand meaning unless parents driving off young. No food calls."

SUMMARY

1. A detailed study was made of a pair of Barn Owls which nested in the casement of a high college tower in San Jose, California.

2. The most frequently utilized food of this owl in this region was the western pocket gopher, *Thomomys*.

3. The scream of the Barn Owl is a rasping *skree-ak!* and as the adult Barn Owls flew about they uttered a distinct clicking sound.

4. A total of 15 days elapsed between the hatching of the first egg and the sixth egg. The seventh was never to hatch.

5. Weight of Barn Owl No. 1 at its maximum when 46 days of age on April 27 was 608 grams. This owl decreased to 529 grams on May 15. As it made its final flight from the casement on May 17 it weighed 573 grams.

6. Weight of Barn Owl No. 2 at its maximum when 43 days of age on May 1 was 650.3 grams. This owl decreased to 517.5 grams on May

20. As it made its flight from the casement on May 24 it weighed 569 grams.

7. Presuming the average hatching weight of the young Barn Owls at 20 grams, then on May 1 the weight of 650.3 grams (the greatest weight attained) of Barn Owl No. 2 would have multiplied by about thirty-two and one-half times the average hatching weight.

8. Young Barn Owl No. 2 weighed at nest-leaving 569 grams, or about twenty-eight and one-half times the average hatching weight of 20 grams.

9. On April 11, the behavior of the young owls indicated greatly increased violence in fighting the observer, and on April 13 it was necessary to place the young owls in a sack to subdue their violence in order to weigh them.

10. Barn Owl No. 1 was observed to fly from the margin of the casement on May 13, when it was 62 days old.

11. Barn Owl No. 2 was able to fly on May 20, when it was 66 days old.

12. The first voice of the young Barn Owls was a quavering squeal. This was heard for the first time from a young owl within an egg near hatching and continued in various forms for many weeks after hatching.

13. On April 8, Barn Owl No. 1 did its first screaming and clicking.

14. On April 10, the young Barn Owls were doing very little squealing, but they were calling frequently an imitation of the adult's *skree-ak;* and the squealing of the young increased after the parental food call had been heard.

15. On April 15, Barn Owl No. 1 hissed and screamed while it was in hand.

16. On May 13, Barn Owl No. 2 was heard responding to calls of adults with a peculiar, rasping *kra-ak*, uttered at intervals of one second —this obviously a food call response.

17. Food-begging by the young Barn Owls was heard in the vicinity of the tower for several days after they had departed from the casement.

18. On June 17, there were no food calls.

19. On April 15, Barn Owl No. 1 showed much of the coloring of the adult, and on April 22, the facial disc of No. 1 was almost white.

20. On April 24, No. 1 was observed to be shedding down extensively from its back, and on April 27 it was rapidly shedding the down from its breast.

21. On May 12, the facial disc of Barn Owl No. 2 was ruddy or cinnamon in color.

REFERENCE

The most complete and satisfactory reference to the Barn Owl is A. C. Bent, 'Life Histories of North American Birds of Prey (Part 2)': 140–153, 1938. The reference cites all of the significant research papers of recent years.

San Jose
California

THE SEASONS OF BIRD SONG. REVIVAL OF SONG AFTER THE POSTNUPTIAL MOLT

BY ARETAS A. SAUNDERS

A GOOD many of our singing birds revive the song in late summer or fall, usually after the molt that closed the nesting season is over. A few species revive the song every year. Others usually do so, but are not to be heard in certain years. Still others revive the song rarely, only in one or two years, interspersed by long periods of years of silence. A number of species, as far as I can determine, have never been known to revive the song.

The data on revival in this paper are chiefly from southern Connecticut; but for revival in July and August, most of the data are from Allegany State Park, N. Y. Only in the last six years have I had full opportunity to study revival, in those months, in Connecticut.

My studies of revival are by no means as complete as those of spring singing and cessation, for two reasons. In the fall there is no period of daylight, in which an avocation may be followed, before the time that work on a vocation must begin. In the earlier years of my studies, certain allergic troubles often made field observation at that season out of the question.

There is great variation from one season to another in the extent of fall singing. Even species that sing every fall do so much more frequently in one year than another. There are also certain days on which many birds of different species sing frequently and abundantly, followed by other days in which there is very little singing or none at all.

After some study of records in relation to the information I can get about molts, I have concluded that the study of revival belongs mainly or entirely to passerine birds. There is a certain amount of singing or calling on the part of the cuckoos, the Whip-poor-will and the Flicker, but no definite evidence to show that this is revival after the molt. September singing of the Wood Pewee is, according to authorities, not after the molt but before it.

I have omitted from the list some species, such as the crows and jays that, in my opinion, are not true singers. Other omitted species are either too rare or too locally distributed in this region for me to obtain data, or they are ones that apparently never sing in the fall.

Bicknell's studies (1884–1885) include notes on revival and fall song that are similar to mine in most cases. His notes are mainly from the vicinity of New York City. Since his articles are now not easily available to all students I have mentioned a number of his records that are significant.

In the Birds of Connecticut (Sage and Bishop, 1913) Dr. L. B. Bishop records a number of dates of early and late singing of various species. I am mentioning those that are of special significance. Since they are Connecticut records, and probably mainly from the vicinity of New Haven, they are essentially from the same locality as mine.

It is a general theory that those species that change the color of the male plumage between summer and winter do not sing in the fall. This is mainly true but there are some exceptions. The converse of this, that species that do not change coloring do sing in the fall, is far from true in a number of cases. What is probably of greater significance is the acquirement of fat. Bicknell (1884–1885) gives numbers of instances to show that birds cease to sing when they acquire fat in the fall.

Species reported to sing in the fall, but on which I have no data, are as follows: Hermit Thrush (*Hylocichla guttata*) heard by Bicknell (1884: 131) Oct. 18, 1880; Olive-backed Thrush (*Hylocichla ustulata*) reported by Bicknell (1884: 130) as heard by another unnamed observer at Bay Ridge, Long Island, Sept. 26, 1880; Indigo Bunting (*Passerina cyanea*) observed in flight song by Bicknell (1885: 152) on Sept. 23, 1879.

The following are the species on which I have data:

Crested Flycatcher (*Myiarchus crinitus*).—The average dates of revival are Aug. 15 to Sept. 2. The earliest date is Aug. 8, 1941, and the latest, Sept. 10, 1944.

Phoebe (*Sayornis phoebe*).—The song is revived in September and October, but is not heard every year. In twelve years the dates average Sept. 17 to Oct. 9; the earliest is Sept. 6, 1923, and the latest, Oct. 23, 1940. I once observed the flight song—Sept. 27, 1944.

Least Flycatcher (*Empidonax minimus*).—The song of this species is rarely revived. In Allegany Park I heard it Aug. 11, 17 and 22, 1922; Aug. 11 and 22, 1927; and Aug. 11, 1933. In Connecticut it was heard Aug. 8, 1941, Sept. 7, 1940, and Sept. 23, 1946.

Black-capped Chickadee (*Parus atricapillus*).—The singing of this bird in fall is so irregular that averaging dates is of little value. In thirty years of observation this species was present in the fall, but was only heard singing in eighteen of those years. In three of those years it sang only in September; in three others, only in October; in two, only in November; and in one, not until December. In some years, when no song was heard, the bird was comparatively scarce, but in others it was as common as usual but was not heard singing. It is sufficient to say that it may be heard in every fall month, in a period of years, but sings less frequently then than in the spring.

White-breasted Nuthatch (*Sitta carolinensis*).—I have only one fall record of this bird's song—Sept. 19, 1940. Another unusual date is Dec. 24, 1922.

House Wren (*Troglodytes aëdon*).—This bird is not a common fall singer. Most of the fall songs are of the primitive type (Saunders, 1929: 48). They are frequently a faint, indefinite warble, not recognizable as to species unless the bird is seen. In only two years have I heard the full song in the fall—Sept. 6, 7, and 18, 1941, and Sept. 29, 1946. In seven other years primitive songs have been heard. The average date for these is Sept. 16. The earliest is Sept. 4, 1937, and the latest, Oct. 14, 1940. The latter is my only October date.

Winter Wren (*Troglodytes troglodytes*).—I have heard this species in fall only three times—Oct. 23, 1929, Nov. 13, 1932, and Oct. 28, 1939. Other records are: Nov. 21, 1880 (Bicknell, 1884: 138) and Nov. 4, 1903 (Bishop, 1913: 171).

Carolina Wren (*Thryothorus ludovicianus*).—The occurrence of this species in Connecticut is so irregular that it is difficult to tell much about its song periods. When common it is a persistent singer and the song may be heard in every month of the year. In eight years, in which it was common enough to give a fair idea of its seasons, the beginning of fall singing averaged Sept. 10; the earliest was Aug. 31, 1941, and the latest Sept. 26, 1931. The end of the period averaged Nov. 3; the earliest, Oct. 14, 1944; and the latest, Nov. 26, 1946.

Long-billed Marsh Wren (*Telmatodytes palustris*).—Areas where this species formerly bred have largely been destroyed by the spread of civilization, and I have had little opportunity to determine much about its song seasons. On Sept. 4, 1944, and Sept. 3, 1946, I found birds in song, in both cases singing a song of such primitive character that I could not have recognized it had I not seen the singer. According to Bicknell (1884: 139) its fall singing is irregular. He cites Sept. 7, 1879, and Oct. 3, 1880, as latest dates in each of those years. Dr. Bishop (1913: 172) gives Sept. 18, 1895, and Sept. 26, 1904, as late dates.

Short-billed Marsh Wren (*Cistothorus stellaris*).—It is difficult to determine just what is revival singing in this species. According to Dwight (1900: 296) it molts in August. Yet, in 1941 and 1942 it appeared in Connecticut in the latter half of July in considerable numbers, and sang continuously from then until September, being last heard Sept. 2, 1941, and Sept. 7, 1942. Bicknell (1884: 139) found it ceasing to sing in August and reviving the song Sept. 22, 1878, Sept. 18, 1881, and Oct. 23, 1880; his remarks indicate that these late songs were all more or less primitive in form.

Catbird (*Dumetella carolinensis*).—A rare fall singer. I have heard it in only six years, and usually only once in any one year. The dates average Sept. 27, but have a wide variation, from Sept. 1, 1939, to Oct. 22, 1928. The song at this season is short, fragmentary, and often of primitive nature.

Brown Thrasher (*Toxostoma rufum*).—I have heard this bird singing in the fall just once, Sept. 13, 1944. Bicknell (1884: 132) records it on Sept. 8, 1881.

Robin (*Turdus migratorius*).—The Robin is a fairly regular fall singer, but I do not hear it every year. In thirty years of records I have heard it in nineteen years and missed it in eleven. The average dates are from Sept. 28 to Oct. 17. The earliest song is Sept. 13, 1930, and the latest, Nov. 6, 1946.

Wood Thrush (*Hylocichla mustelina*).—I have heard this bird only once in the fall—Sept. 7, 1941.

Bluebird (*Sialia sialis*).—I have heard this bird in fall song only on Oct. 10 and 11, 1940. Bicknell (1884: 133) states that it is occasionally heard in September and October but he gives no definite dates. Dr. Bishop (1913: 181) records it for Oct. 22, 1892.

Ruby-crowned Kinglet (*Regulus calendula*).—This bird frequently sings while passing through in fall migration. I have recorded the song in twelve years, but in some years, though the bird is as common as usual, no song is heard. The average dates are Oct. 4 to Oct. 20; the earliest, Sept. 26, 1914 (at West Haven, Conn.); and the latest, Nov. 1, 1919.

Northern Shrike (*Lanius excubitor*).—My only record of fall singing for this species is Nov. 8, 1921.

White-eyed Vireo (*Vireo griseus*).—All of the vireos that are summer residents in southern Connecticut revive the song in late August or September, only a week or two after the song of the nesting season has ceased. The White-eyed Vireo averages Sept. 1 to 13; the earliest date is Aug. 19, 1942, and the latest, Sept. 21, 1946.

Yellow-throated Vireo (*Vireo flavifrons*).—The revival song of this

species averages from Aug. 19 to Sept. 14. The earliest is Aug. 15, 1943, and the latest, Sept. 26, 1945.

Blue-headed Vireo (*Vireo solitarius*).—This species breeds in the Allegany State Park, where I obtained notes on revival of song, in late August, in only three summers. The dates were: Aug. 29, 1929; Aug. 27, 1935; and Aug. 28, 1937. In other years no singing was heard, after its cessation, to the end of August. In Connecticut, where the bird occurs in migration, I have heard the song in September or October in sixteen years. The average dates are Oct. 2 to Oct. 16. The earliest is Sept. 11, 1943, and the latest, Oct. 23, 1932.

Red-eyed Vireo (*Vireo olivaceus*).—This bird is so persistent in singing that it is difficult to judge just where summer singing ends and revival begins. The dates I consider to be revival average Aug. 20 in Connecticut and Aug. 26 in the Allegany State Park. The end of fall singing is more definite. It averages Sept. 10, with the earliest on Sept. 1, 1935, and the latest, Oct. 3, 1922.

Warbling Vireo (*Vireo gilvus*).—This bird has become so scarce in recent years, in my opinion due to poison sprays in the elm trees, that I am unable to determine, from my few scattered records, just when revival begins. But the last songs are more definite. In twelve years the last song averages Sept. 12, with the earliest on Sept. 5, 1945, and the latest, Oct. 3, 1922. It is of interest that the last dates for both this and the preceding species are the same, both birds being in song that day, and are the only October records I have for either species.

Black and White Warbler (*Mniotilta varia*).—This bird, whose regular song ceases early, revives song in July or early August. In Allegany Park it is too scarce for my notes to be of much value. In Connecticut the revival song averages July 24 to Aug. 26. The earliest song is July 17, 1944, and the latest, Sept. 6, 1941. Bicknell, (1884: 210) records a much later date—Sept. 23, 1879.

Worm-eating Warbler (*Helmitheros vermivorus*).—I have heard this bird only once, after its regular song period ceased. This was Aug. 5, 1941. Bicknell (1884: 210) records it for Aug. 14 and 21, 1881.

Blue-winged Warbler (*Vermivora pinus*).—This bird revives singing in late July, and continues to sing until its departure in late August. Dates average July 17 to Aug. 22. The earliest beginning is July 11, 1945, and the last song is Sept. 6, 1933. Songs at this period are commonly the second song (Saunders, 1935: 179) and frequently flight songs.

Tennessee Warbler (*Vermivora peregrina*).—I have heard migrating birds of this species sing in fall just twice. In Allegany Park, N. Y., on Aug. 8, 1932, and in Connecticut, Sept. 17, 1921.

Parula Warbler (*Parula americana*).—I heard a song from this species in Allegany Park, N. Y., on Aug. 23, 1933. Bicknell (1884: 212) records a song Sept. 18, 1881.

Yellow Warbler (*Dendroica petechia*).—This species revives its song in late July, and usually continues to sing until late August. I had no opportunity to make regular observations in Allegany Park. In Connecticut the song averages July 28 to Aug. 20, the earliest being July 21, 1946, and the latest, Aug. 25, 1941. In September I have heard single songs Sept. 7, 1940, and Sept. 21, 1942; the latter was one of primitive character.

Magnolia Warbler (*Dendroica magnolia*).—In the Allegany State Park this bird sings occasionally in August, after the regular period is over. I have heard it Aug. 16 and 27, 1922; Aug. 26, 1932; Aug. 12, 13, 1938; and Aug. 10, 11, 1940. Some of these dates are earlier than the latest regular singing; for this species sang regularly until Aug. 15, 1937. But 1937 was an unusual year in that respect, and in 1938 and 1940 it was very evident that regular singing of this species ceased in July.

Black-throated Blue Warbler (*Dendroica caerulescens*).—In five of the sixteen summers I spent in the Allegany Park, this bird revived its song in August. It was heard Aug. 5, 8, 9, and 22, 1922; Aug. 7, 1934; Aug. 9 and 21, 1936; Aug. 6, 7, 8, and 10, 1937; and Aug. 7, 1939. I have never heard it in fall migration, but Bicknell (1884: 213) records Sept. 22, 1878.

Myrtle Warbler (*Dendroica coronata*).—Fall singing of this species, in my records, is confined to a single song heard Oct. 4, 1942.

Black-throated Green Warbler (*Dendroica virens*).—This species sings rarely after the nesting season. I have heard it only on Oct. 3, 1941, and Sept. 24, 1942. On the second date the song was incomplete and of somewhat primitive character.

Chestnut-sided Warbler (*Dendroica pensylvanica*).—In Allegany Park I have heard late songs of this species Aug. 11, 1931, and Aug. 9 and 19, 1937. In Connecticut it sang on Aug. 17, 1942; Aug. 30, 1944; and Aug. 9 and Sept. 1, 1946.

Prairie Warbler (*Dendroica discolor*).—Dates for late singing of this species are: Sept. 7, 1923; Sept. 10, 1931; Sept. 3, 1936; and Aug. 21, 1946.

Oven-bird (*Seiurus aurocapillus*).—The revival song of this species is sometimes the regular territory song and sometimes the flight song. The regular song was heard in Allegany Park on Aug. 23 and 27, 1922; Aug. 8, 1928; and Aug. 23 and 24, 1939. Flight songs were heard on

July 21 and 25 and Aug. 3, 1934; Aug. 27, 1936; and Aug. 3, 11, and 22, 1937. In Connecticut regular song was heard on Aug. 12 and 24, 1941, and Aug. 21 to 24, 1943. A flight song, Sept. 26, 1941, is the only record I have of singing after August.

Northern Water-thrush (*Seiurus noveboracensis*).—Although this species is a regular migrant in August, both in Allegany Park and Connecticut, I have heard the revived song only in Connecticut, on Aug. 22 and 29, 1943, and Aug. 10, 1944.

Louisiana Water-thrush (*Seiurus motacilla*).—In the Allegany Park, a few birds of this species occur each year in fall migration in July or early August. I have heard them sing there only on July 20, 1928, and July 15, 1937. In Connecticut there is a period of song in July and August which averages July 7 to Aug. 3. The earliest date is July 1, 1943, and the latest, Aug. 8, 1945. On July 24, 1942, a bird indulged in an elaborate flight song.

Mourning Warbler (*Oporornis philadelphia*).—In the Allegany Park, this species usually revives its song in late July or August. I have recorded it in thirteen of the sixteen summers I spent there. It averages Aug. 5 to Aug. 16; the earliest date is July 26, 1927, and the latest, Aug. 22, 1937. The revived song is often a flight song.

Yellow-throat (*Geothlypis trichas*).—In the Allegany Park I recorded this species in revival song in only seven of the sixteen summers. In four of these years, only the flight song was heard, on dates varying from Aug. 8, 1932 to Aug. 30, 1935. In the other three years, only the regular song was heard on dates varying from Aug. 10, 1939, to Aug. 24, 1936. In Connecticut, the revived song has been heard in every one of the past six years, averaging Aug. 15 to Sept. 1; the earliest was Aug. 10, 1941, and the latest, Sept. 7, 1941. This was mainly the regular song but there were flight songs in 1943 and 1945, and in 1946 all of the revival songs were flight songs.

Hooded Warbler (*Wilsonia citrina*).—While this species is a regular breeder in Allegany Park, it is not common and I have never heard a revival song there. In Connecticut I have heard songs on Sept. 1, 1943; Aug. 19, 1944; and Aug. 12, 1946.

Canada Warbler (*Wilsonia canadensis*).—This species breeds commonly in the Allegany Park where it revives the song every summer so soon after the cessation of the regular song period that at first I thought that period lasted until mid-August. There is, however, a songless period in late July, varying sufficiently from year to year that dates of first revival in one year may be earlier than cessation of the nesting

song in another. The revival song averages July 29 to Aug. 16; the earliest is July 23, 1934, and the latest, Aug. 29, 1932. In Connecticut, where the bird occurs only in migration, fall songs are heard occasionally, but not every year. The earliest song is Aug. 17, 1943, and the latest, Sept. 7, 1941.

Redstart (*Setophaga ruticilla*).—The revival singing of this species is irregular. Records of late singing in the Allegany Park are: Aug. 18, 19, 1934; Aug. 2, 6, 1935; and Aug. 10, 1939. In Connecticut, the song is more frequent and averages July 29 to Aug. 20; the earliest, July 22, 1943 and the latest, Aug. 24, 1941. Revival singing varies so much from year to year that in 1942 there was a very short period of cessation, whereas in 1945 I heard a revival song only once, on July 31, and in 1946 there was very little revival singing. Bicknell (1884: 217) records a song on Sept. 5.

Eastern Meadowlark (*Sturnella magna*).—This is one of the few species that sing every year in the fall. In twenty-four years of observation the average dates are Sept. 24 to Nov. 15. In some years the bird begins to sing early in September and continues to December. In others, there is only a little song in October or early November. The earliest date for the beginning of fall song is Sept. 3, 1939, and the latest, Oct. 15, 1918. The earliest last song is Oct. 26, 1935, and the latest, Dec. 19, 1937.

Red-wing (*Agelaius phoeniceus*).—The song of this species is rarely heard in the fall. Records are: Oct. 31, 1937, and Oct. 12, 16, and 31, 1943.

Orchard Oriole (*Icterus spurius*).—My only records, after the regular song period, are Aug. 20 and 21, 1943, and Aug. 9, 1946.

Baltimore Oriole (*Icterus galbula*).—The song of this species is revived every year in late July and August. In some years revival follows cessation so closely that I can only guess which dates are the last of the nesting singing and which the first of revival. Using these guesses, the beginning of revival averages July 24, with the earliest on July 15, 1945, and the latest, July 28, 1941. The final song averages Sept. 2; the earliest is Aug. 30, 1942, and the latest, Sept. 7, 1941. The revived songs begin with ones that are short and curtailed, but they gradually pick up to full songs in mid-August. But never, at this season, is song so frequent or exuberant as it is in spring.

Rusty Blackbird (*Euphagus carolinus*).—I have heard this bird in fall only on Oct. 31, 1937, and Oct. 12, 1945. Bicknell (1885: 252) indicates that it is a fairly common fall singer. I find that I have

missed seeing it at all in a number of fall seasons. Perhaps the species was commoner in past years than it is today.

Scarlet Tanager (*Piranga olivacea*).—This bird sings rarely in September. Records are: Sept. 14, 1922; Sept. 22, 1935; and Sept. 3, 5, and 6, 1944. When one hears this song in September it is an opportunity, in my experience, to observe a male bird in the full winter plumage.

Rose-breasted Grosbeak (*Pheucticus ludovicianus*).—In Allegany Park, I heard this bird in song on Aug. 17 and 23, 1933. In Connecticut, records are: Aug. 28, 1941; Aug. 15, 31, 1942; Aug. 29, 30, 1943; and Sept. 16, 1945. On two occasions the August singers proved to be young males in immature plumage. Bicknell (1885: 151) records a young male singing, Sept. 23, 1879.

Purple Finch (*Carpodacus purpureus*).—Records of the singing of this species on Sept. 5, 1942, and Aug. 11, 1946, are evidently from breeding birds. In fall migration, when the species is much more numerous, singing averages Oct. 10 to Nov. 3. The earliest of this singing is Sept. 29, 1941, and the latest, Nov. 19, 1927. Songs heard Oct. 28 and Nov. 12, 1944, were not the typical song, but the "vireo" song (Saunders, 1935: 246).

Goldfinch (*Spinus tristis*).—This bird is a rare fall singer. Records are: Oct. 28 and Nov. 1, 1919; Nov. 20, 1926; Oct. 26, 1935; Nov. 13, 1938; and Sept. 14, 1940.

Towhee (*Pipilo erythrophthalmus*).—Records of fall song for this bird are: Oct. 12, 1935; Oct. 8, 1939; and Oct. 3, 1946. Though fall song is infrequent, it is as loud, full and complete as is the song in spring.

Savannah Sparrow (*Passerculus sandwichensis*).—On Sept. 17, 1922, I traced to its source an indefinite, buzzy song that was entirely unrecognizable and found the bird to be a Savannah Sparrow.

Vesper Sparrow (*Pooecetes gramineus*).—I have only two records of fall singing: Oct. 22, 1918, and Sept. 25, 1932. Bicknell (1884: 330) records a flight song, Sept. 30, 1883.

Slate-colored Junco (*Junco hyemalis*).—My only records for fall singing of this species are: Oct. 22 and 26, 1918; Oct. 21, 1934; and Oct. 27, 1935.

Tree Sparrow (*Spizella arborea*).—I have heard this species in fall song in seven years, usually on only one date in each year. The average date is Nov. 11; the earliest, Oct. 30, 1938; and the latest, Nov. 19, 1943.

Chipping Sparrow (*Spizella passerina*).—A single bird in song, Aug.

21, 1944, is the only record I have of singing after the regular period. Bicknell (1885: 145) records songs from Sept. 24 to Oct. 10.

Field Sparrow (*Spizella pusilla*).—I have records of a full song of this species only on Sept. 26, 1931, and Sept. 28, 1941. In four other years I have recorded primitive songs, varying from Oct. 10 to Oct. 26.

White-crowned Sparrow (*Zonotrichia leucophrys*).—Records of fall singing for this species are: Sept. 27, 1914; Sept. 30, 1928; Oct. 8 and 9, 1938; and Oct. 2, 1943. It is a rather rare bird in Connecticut. In regions where it is more numerous, probably fall song is heard frequently.

White-throated Sparrow (*Zonotrichia albicollis*).—This species is one that can be heard in song every fall. I have records for twenty-five years. The average dates are Oct. 6 to Nov. 6. The earliest song is Sept. 26, 1926 and 1931. The latest is Nov. 29, 1940. The first arrivals in fall are not in song. I have always seen this species in fall before I have heard a song, and the wait for song ranges from two days to three weeks. Fall songs are not commonly perfect and full. They are shortened, or the pitch of the last notes is badly flatted, as if the bird had not energy enough to keep it up.

Fox Sparrow (*Passerella iliaca*).—I have records of fall singing in this species for ten years, but usually only one or two days in each year, and of intervening years in which the bird was often common but no song was to be heard. The dates of songs average about Nov. 13, with the earliest, Oct. 30, 1927, and the latest, Nov. 23, 1939.

Swamp Sparrow (*Melospiza georgiana*).—Bicknell (1885: 149) writes of this species as a common fall singer, giving Sept. 18 to Oct. 17 as limits of the singing season. My observations are confined to a single case of a bird singing a song of primitive character on Oct. 8, 1932. Probably Bicknell had access to some large swampy areas where this bird was a common breeder. There are no such areas in southwestern Connecticut, and breeding birds are few and generally isolated. The species is common in migrations, but evidently migrating birds do not often sing.

Song Sparrow (*Melospiza melodia*).—This species is the most regular and dependable fall singer of all of our birds. I have records of its singing for twenty-seven years. The average date for the first song is Sept. 30; the earliest, Sept. 13, 1942; and the latest, Oct. 11, 1931. The song period continues to November, averaging Nov. 21. The earliest last song is Nov. 6, 1936, and the latest, Dec. 4, 1941. When one studies details of individual songs and learns to recognize indi-

vidual birds by this means (Saunders, 1924) it may frequently be noted that fall singers are the same individuals, occupying the same territory that they did in summer (Nice, 1943: 125). Occasional songs, mainly in September, are of primitive type, but I more frequently hear such songs at the close of the nesting season in August or the beginnings of spring song in February or March.

REFERENCES CITED

BICKNELL, EUGENE P.
1884–1885. A study of the singing of our birds. Auk, 1: 60–71, 126–140, 209–218, 322–332; 2: 144–154, 249–262.

DWIGHT, JONATHAN, JR.
1900. The sequence of plumages and moults of the passerine birds of New York. Annals N. Y. Acad. Sci., 13: 73–360.

NICE, MARGARET MORSE
1943. Studies in the life history of the Song Sparrow. II. Trans. Linn. Soc. New York, 6: 1–329.

SAGE, JOHN H., AND BISHOP, LOUIS B.
1913. The birds of Connecticut. State Geol. and Nat. Hist. Survey, Bull. No. 20: 1–370.

SAUNDERS, ARETAS A.
1924. Recognizing individual birds by song. Auk, 41: 242–259.
1929. Bird song. New York State Museum, Handbook 7: 1–202.
1935. A guide to bird songs: 1–285. (New York.)

Fairfield
Connecticut

BIRDS OF THE ALTA LAKE REGION, BRITISH COLUMBIA

BY KENNETH RACEY

DURING 1926, a list of the birds found in the Alta Lake district was published in The Auk (*see* Auk, 43: 319, July, 1926). Since the compilation of this list, twenty years ago, many new records for the region have been found, and several corrections have been made in the original list.

During the past twenty years, there has been but little change in the climatic conditions, this period participating in the usual climatic cycles. Some of the glaciers in the surrounding mountains have receded to a noticeable extent, and others have entirely disappeared. In near-by Pemberton Valley, the precipitation for 1945 was 37 inches, whereas the average for the past thirty-three years is 35 inches.

Alpha and Nita lakes are no longer "milky" glacial-fed lakes, but have become clear, as was Alta Lake twenty or more years past.

Unfortunately, logging and sawmill operations are now being carried on at numerous points along the P. G. E. Railway, which runs through the region in question, and are doing an immense amount of damage. No apparent attempt is being made to curb the careless logging methods practiced, which leave debris and desolation everywhere, as well as blocking the old-time trails. Worst of all, however, is the fire hazard created, and in some instances great areas have been burnt and the once beautiful mountainsides left barren, with but little or no signs of natural reforestation taking place.

Deer and grouse have very greatly decreased in number, and there is little doubt that the once abundant rainbow trout in Alta Lake are being adversely affected by the sawdust now entering the lake.

The following list is an endeavour to bring up to date the studies on bird life of the region under consideration.

Subspecific determinations have been made from specimens collected.

LESSER LOON, *Gavia immer elasson* Bishop.—During the summer months, these birds may be seen almost every day on one or more of the chain of lakes. Three adult loons were seen together in front of our camp on Alta Lake on August 7, 1937, and five appeared on August 22. No nest has been found, although two downy young were reported as seen by Mr. Alec Phillips on Lost Lake in 1924. On November 15, 1931, while I was watching a shoal of rainbow trout passing in front of Harrops Point, a loon suddenly appeared under water, following the trout. On October 12, 1946, an adult, molting to winter plumage, came circling overhead at the excellent imitation of the loon's call by Mrs. G. W. Burbidge, and then came to rest on the water close to us.

HOLBOELL'S GREBE, *Colymbus grisegena holbölli* (Reinhardt).—Common migrant from August to November. Flocks of two or three to twenty or more usually arrive during night time, remain a few days resting, and then continue southward. On August 28, 1937, thirteen of these birds arrived and spent four days on Alta Lake, and then took their departure. All thirteen appeared to be adult birds. Five juvenile birds were seen about Alta Lake on October 13, 1946.

HORNED GREBE, *Colymbus auritus* Linnaeus.—Only occasionally seen during the months of August, September and October in migration.

WESTERN GREBE, *Aechmophorus occidentalis* (Lawrence).—Seen only in southbound migration from a few scattered individuals to very large

flocks which remain on the lake only for a short time. Both arrival and departure take place at night. These birds usually begin to arrive during the last week of August. On August 28, 1923, Mrs. Racey saw a flock of over two hundred on Alta Lake. They all left during the evening, making a great noise when rising and departing.

PIED-BILLED GREBE, *Podilymbus podiceps podiceps* (Linnaeus).—Never noted in any numbers, but each fall a few individuals pass through. An adult was seen August 12, 1937, and again on the 22nd. Two remained near the camp, and one of these kept close to the float. Two others arrived on the 24th and left on the night of the 26th. Three young birds came September 6 and remained at the Lake near camp for nearly a fortnight. They were very shy and alert.

NORTHWESTERN COAST HERON, *Ardea herodias fannini* Chapman.—A summer resident, seen almost daily flying from lake to lake. Believed to nest somewhere about Green Lake. Footprints of a heron were noticed in the snow on a small bridge crossing a slough as late as November 11, 1944.

WHISTLING SWAN, *Cygnus columbianus* (Ord).—Fall migrant during November 7 to 10, 1944. Flocks of three, four and six were seen on Alta Lake, only remaining for a few hours. On November 11, a single cygnet arrived during the night and remained about the lake until 11 a. m. We watched it through our field glasses as it swam about on the opposite side of the lake. At one time it turned and joined a flock of Buffleheads, where it remained for a few minutes and then continued on, and when about a hundred yards distant, it lifted, made a great circle towards the north end of the lake, and then bore off southwards, passing a few feet above our boat.

TRUMPETER SWAN, *Cygnus buccinator* Richardson.—Formerly a regular winter resident. When first seen in 1922, there were eleven birds in the flock, and these gradually dwindled in number until the winter of 1927 when two adults and a cygnet appeared. These were shot at by loggers from a near-by camp until both adults were killed. Mr. P. D. Lineham found the body of one of these birds and hung it in a tree near the shore of Green Lake. Shortly afterward, there was a heavy snowfall which permitted a coyote to reach the bird and eat it. Mr. John Bailiff states that three adults and four cygnets wintered on Daisy Lake in 1920, and that eleven swans believed to be Trumpeters came to Alta Lake in 1937, just as the ice was going out. Two were seen by Mr. Bailiff on Cheakamus Lake in December, 1943, before that lake froze over.

COMMON CANADA GOOSE, *Branta canadensis canadensis* (Linnaeus).

—Migrates in numbers annually through Pemberton Valley and southward over Lillooet Lake. At Pemberton, wild Canada Geese have remained and bred with the domestic Toulouse Geese on Mr. John Ronayne's ranch, but so far the progeny have proved infertile. Mr. Bailiff advises me that he had found the nest of a Canada Goose on the top of a muskrat's house, at the east end of Cheakamus Lake during the latter part of May, and watched the young hatching out. This nest was in use for three years in succession. A nest was also found on the Soo River which drains into Green Lake. In 1937, a pair of Canada Geese nested in the bush about one mile from the pond, on the Lorimer ranch, and the young birds were seen on the trail. The Lorimer's place lies midway between Alta and Green lakes. On August 17, 1937, during the evening, nine geese were seen flying southward over the lake. On August 7, 1944, Dr. Cowan saw seven Canada Geese flying over Alta Lake. The late Mr. G. L. Wright told me he had seen a flock of five Canada Geese on August 26. The flock flew southward, and later on one lone bird returned.

LESSER CANADA GOOSE, *Branta canadensis leucopareia* (Brandt).—One of these geese spent two summers about the ranch of Mr. John Ronayne, Pemberton Valley.

CACKLING GOOSE, *Branta canadensis minima* Ridgway.—Seen occasionally in Pemberton Valley where a hunter shot one in the fall of 1944. A flock of eleven was seen flying about Alta Lake on December 22, 1944.

LESSER SNOW GOOSE, *Chen hyperborea hyperborea* (Pallas).—Two flocks, numbering fifty and twenty-five birds, were seen on Alta Lake, November 7, 1944, and a third flock of thirteen individuals was seen on November 9, 1944.

COMMON MALLARD, *Anas platyrhynchos platyrhynchos* Linnaeus.—Mallards were found breeding in the slough near Mile 38. On January 6, 1937, with the temperature 8° below zero, I saw a male and three females on 21 Mile Creek and was advised by Mr. Fred Woods, a local resident, that several Mallards had remained about this creek the previous winter. Flocks of Mallards are occasionally seen on Alta and Green Lakes in the fall, en route southward. They breed about Green Lake, and flocks of them have been seen there at different times. Common in Pemberton Meadow. Six birds were seen flying down Alta Lake on August 2, 1942.

BALDPATE, *Mareca americana* (Gmelin).—A male and two females were seen on Alta Lake, September 30, 1944. These had arrived during the night, and remained about the lake until the following day.

SHOVELLER, *Spatula clypeata* (Linnaeus).—Only once noticed on Alta Lake—a young bird seen near Rainbow Lodge on September 1, 1923.

WOOD DUCK, *Aix sponsa* (Linnaeus).—Mr. J. Bailiff states that two Wood Ducks were seen near Brandywine Falls in April, 1921, and that three—one male and two females—were seen on Cheakamus River in the spring of 1935.

CANVAS-BACK, *Aythya valisineria* (Wilson).—Half a dozen were shot by Mr. Bailiff from a flock of twenty or thirty in the latter part of November, 1942.

GREATER SCAUP DUCK, *Aythya marila nearctica* Stejneger.—Both Greater and Lesser Scaup Ducks are seen in fall migration. An adult female was taken November 10, 1944, from a flock of ten birds.

LESSER SCAUP DUCK, *Aythya affinis* (Eyton).—A juvenile female was taken by Alan Racey on November 9, 1944, and the following day the writer secured an adult male.

BARROW'S GOLDEN-EYE, *Glaucionetta islandica* (Gmelin).—A common resident on all the lakes. A nest was found in a hole in the fork of a cottonwood tree, about fifty feet above ground, on July 1, 1920. The mortality among the young birds appears to be very high, for it has been noted that of the birds nesting on Alta Lake, seldom more than two or three of the young brood survive, due, it is believed, to depredations by minks. These Golden-eyes remain very late about the lakes and do not leave until freeze-up, and then quickly return when open water is again in evidence.

BUFFLE-HEAD, *Glaucionetta albeola* (Linnaeus).—Usually very numerous in the fall. On November 16, 1931, a flock of two hundred and fifty to three hundred arrived on Alta Lake. Of these, between eighty-five and ninety per cent were adult males. Mr. Bailiff states that on November 1, 1940, a flock of about two hundred Buffle-heads arrived on the Lake, and of these, between sixty-five and seventy per cent were in adult male plumage. During the fall of 1944, only small flocks appeared, fairly evenly divided in numbers between males and females. The usual southbound flocks did not put in an appearance during the fall of 1945.

WHITE-WINGED SCOTER, *Melanitta fusca deglandi* (Bonaparte).—Common migrant. Frequently seen in flocks of four to eight birds, from late August into November, en route to the sea.

SURF SCOTER, *Melanitta perspicillata* (Linnaeus).—A common migrant in the fall. On November 15, 1931, mixed flocks of Surf and White-winged Scoters as well as Mallards Golden-eyes, and Buffleheads were seen on Alta Lake.

HOODED MERGANSER, *Lophodytes cucullatus* (Linnaeus).—Three females were seen at the south end of Alta Lake on September 29, 1944. Two were later seen on November 9, 1944.

AMERICAN MERGANSER, *Mergus merganser americanus* Cassin.—Not common but seen occasionally on Alta and Lost lakes. Several of these mergansers arrived on September 4, 1932, in company with half a dozen Golden-eyes.

WESTERN GOSHAWK, *Accipiter gentilis striatulus* (Ridgway).—From early August to winter, both adults and immature birds are common. Specimens were taken near Green Lake and at Pemberton, as follows:—Oct. 15, 1929, ♀ imm.; Oct. 31, 1929, ♂ ad.; Jan. 2, 1929, ♂ imm.; Dec. 3, 1936, ♂ ad.; Oct. 14, 1938, ♂ ad.; Aug. 12, 1939, ♂ imm.

SHARP-SHINNED HAWK, *Accipiter striatus velox* (Wilson).—A common fall migrant.

COOPER'S HAWK, *Accipiter cooperii* (Bonaparte).—Summer resident, frequently seen hunting along the mountainsides bordering the lakes. In 1922 a pair nested near Nita Lake.

WESTERN RED-TAILED HAWK, *Buteo jamaicensis calurus* Cassin.—Frequently seen soaring about the surrounding mountains. Between August 23 and 25, 1932, a considerable number of birds of prey were seen at elevations from 6,000 to 7,000 feet on what is now known as London Mountain. Reference to notes made at the time shows that Sharp-shinned, Cooper's, Marsh, and Red-tailed Hawks and Golden Eagles were numerous. In 1920, a pair of Red-tails nested in a fir tree at the southern end of Alpha Lake.

AMERICAN ROUGH-LEGGED HAWK, *Buteo lagopus s.johannis* (Gmelin).—Only one record—a male bird, shot by Mr. Tom Neeland on November 11, 1944, at Mile 34, and sent to the writer.

GOLDEN EAGLE, *Aquila chrysaëtos canadensis* (Linnaeus).—Frequently seen at high elevations, hunting on mountainsides. Two were seen soaring over Sproat Mountain on July 25, 1927. Six were seen on London Mountain between August 2 and 4, 1928. One was noticed sitting on a rock at an altitude of 6,000 feet. Some years ago, an old prospector advised me that a pair of Golden Eagles nested on an inaccessible ledge on Mount Overlord.

Five Golden Eagles were seen hunting about the mountains above Avalanche Pass, June 26, 1924. On August 25, 1932, when I was crossing London Mountain, at an elevation of 6,500 feet, a close approach was made to a Golden Eagle which was sitting with drooping wings on a projecting rock. It was looking down on a hoary marmot which was sunning itself on a ledge about one hundred feet below.

Four eagles were observed soaring over Garibaldi station on September 30, 1944, and although some distance away, they appeared to be of this species.

MARSH HAWK, *Circus cyaneus hudsonius* (Linnaeus).—Not common, and only occasionally seen. A female was collected at Green Lake, Mile 40, on August 8, 1944.

OSPREY, *Pandion haliaetus carolinensis* (Gmelin).—A common summer resident. It nests between Alta and Green Lakes, and near Lost Lake. The nest near Green Lake was seen and photographed on August 29, 1937. Mr. Barnfield, who lived at the north end of Alta Lake in 1922, told the writer that he had carefully watched the Osprey which had a nest on the top of a high stub, and that the parent birds brought in about twenty trout per day to the young.

BLACK PIGEON HAWK, *Falco columbarius suckleyi* Ridgway.—Uncommon, but occasionally seen in migration. On June 10, 1932, at Pemberton a juvenile male was collected by Jack Ronayne, Jr., and sent to the writer. A young male was collected by Dr. Cowan on August 4, 1941, near camp on Alta Lake. The bird was chasing some Gray Jays when shot. Its stomach contained only remains of a beetle.

Two birds were seen at Alta Lake on August 23, 1921; one was seen at Alta Lake, September 14, 1941, and one at an elevation of 5,000 feet on Sproat Mountain, on September 8, 1937.

EASTERN SPARROW HAWK, *Falco sparverius sparverius* Linnaeus.—A summer resident; breeds. A nest was found in an old hemlock stub just behind our camp, and on June 18, 1924, young ones were seen sitting on the telephone wires along the railway track.

SOOTY GROUSE, *Dendragapus obscurus fuliginosus* (Ridgway).—Not so abundant as formerly. On August 4, 1928, five females were found on Mt. Overlord and London Mountain. Each female had a brood, which numbered as follows:—3, 2, 7, 2, and 3. Near by, two male birds were heard hooting on the hillside. These grouse nest about Alta and other lakes, but by early September, nearly all have moved to higher altitudes, and many of the male birds will be found between 4,000 and 5,000 feet. In 1937, three females and young were seen close to Alta Lake on the following dates:—August 7—2 young; August 9—3 young; August 11—3 young. It is believed that the abundance of Horned Owls, Goshawks, and Cooper's Hawks tends to keep the number of grouse in check, not to mention the local logging camps.

FRANKLIN'S GROUSE, *Canachites franklinii* (Douglas).—Resident; breeder. A female with four downy young was seen above Nita Lake at an elevation of 2,500 feet. On a fallen log near by, a downy chick

was found dead but still warm. Dissection showed three claw marks on the body. The stomach was found to contain two red ants, one large green and gray caterpillar, and 61 heads of moss flowers. A male, female, and two half-grown young were seen above Alpha Lake on July 30, 1923. This grouse is less common now than formerly, and is ony occasionally seen.

OREGON RUFFED GROUSE, *Bonasa umbellus sabini* (Douglas).—Formerly common about Alta Lake when there was ample protecting coverage and an abundant food supply. The crop of a Ruffed Grouse examined in the fall contained the following:—

High bush cranberries	8%
Willow buds	15%
Bearberries	20%
Huckleberry buds and woody tips	43%
Waxberries	2%
Strawberry leaves and portions of other unidentified leaves	10%
Small stones	2%

WILLOW PTARMIGAN, *Lagopus lagopus albus* (Gmelin).—During the month of November, 1944, prior to any snowfall, the Willow Grouse were feeding largely on willow buds. Twenty-six birds were seen during the month, as follows: one on the 7th, fourteen on the 6th; eight on the 10th; and three on the 21st. Only one individual was seen in October, 1946, although careful search was made in all places usually frequented by these birds.

ROCK PTARMIGAN, *Lagopus mutus rupestris* (Gmelin).—Reported as having been seen by Mr. Bailiff on Mount Overlord (formerly Red Mountain).

NORTHERN WHITE-TAILED PTARMIGAN, *Lagopus leucurus leucurus* (Richardson).—Common on the surrounding mountains above 5,500 feet elevation. Descends into the surrounding valleys in severe winters when there is a very heavy snowfall. It was seen about Alta Lake during the winters of 1929 and 1932. On August 2, 1928, a female and nine half-grown chicks were seen on a rock slide in a northern exposure on Red Mountain (now Mt. Overlord) (altitude 6,300 feet). Two ptarmigan were seen by Stewart Racey and party on 21 Mile Mountain (altitude approximately 5500 feet) on August 19, 1937.

On September 8, 1937, the writer saw four ptarmigan on rocks in a heather-covered slope on Sproat Mountain, at an elevation of 5,400 feet, and on the following day a female and four nearly grown young were seen at an elevation of 5,700 feet on a rock slide three miles distant. Two specimens were taken. Their crop content was as follows:

No. 2316 Seeds of alpine sedge (*Carex*).....90%
White heather tips.....10%
No. 2319 2 seeds of lousewort (*Pedicularus*)
3 tips red heather
50 seeds western teaberry (*Ganetheria ovalifolia*)
3 seed heads of sedge (*Carex*)

On August 25, 1932, on London Mountain (formerly Mt. Whistler) two female ptarmigan were seen with five and four three-quarters-grown chicks, respectively. In each instance the females were perched on top of rocks, and the young below on the ground. These birds were at altitudes of 6,400 and 6,700 feet. Later on, during the day, two male ptarmigan were seen together on the summit of London Mountain, at an altitude of 7,300 feet.

On August 27, 1932, I found two ptarmigan nests—one at 6,900 feet and the second at 6,700 feet. Both were in moss and heather, among lichen-covered stones, and each nest contained the remains of six hatched eggs. The first nest, found at 6,900 feet, appeared to be the more recently used, and was at the foot of a large rock.

AMERICAN COOT, *Fulica americana americana* Gmelin.—Only occasionally seen about the lake. One of these birds was noticed near camp on August 28, 1941. The species is quite common in the marshes about the Indian reserve at the lower end of Pemberton Valley.

SPOTTED SANDPIPER, *Actitis macularia* (Linnaeus).—Common summer resident; breeds. A nest with eggs was found in the grass by the side of the railroad on July 26, 1930. Three young birds just past the downy stage were found dead on the railroad track. Although crushed and damaged, one was preserved. On December 29, 1945, I saw a Spotted Sandpiper twice at the outlet of Nita Lake, where the stream was not frozen.

GREATER YELLOW-LEGS, *Totanus melanoleucus* (Gmelin).—One was seen by Dr. Cowan on August 31, 1941, and two were seen the following day. Two were seen by Mrs. Noble near Rainbow Lodge, September 12, 1941.

NORTHERN PHALAROPE, *Lobipes lobatus* (Linnaeus).—A flock of four was seen by Dr. Cowan on Alta Lake, August 16, 1941.

GLAUCOUS-WINGED GULL, *Larus glaucescens* Naumann.—Frequently seen each year as they pass down the lake towards the sea. Several rested on the shore of Alta Lake on August 31, 1932. The species was seen September 12 and 13, 1946.

HERRING GULL, *Larus argentatus smithsonianus* Coues.—I saw an adult bird sitting on the shore of the lake near a sawdust pile on August 31, 1932. On August 15, 19, and 29, 1937, a few adult and immature birds passed southward, and on September 4, about a dozen

went through. One adult bird remained for some time on the water in front of the house.

SHORT-BILLED GULL, *Larus canus brachyrhynchus* Richardson.—Several of these birds were seen passing down Alta Lake during the latter part of August, 1932. On August 7, 1937, five adult birds flew down the lake, and up to the 15th of the month a few of these gulls passed by every day or two. On the 22nd, a flock of fourteen passed southwards.

FRANKLIN'S GULL, *Larus pipixcan* Wagler.—A juvenile was taken by Dr. Cowan on August 9, 1941, from a flock of Bonaparte's Gulls.

BONAPARTE'S GULL, *Larus philadelphia* (Ord).—Seen occasionally as they pass seaward. On August 9, 1941, Dr. Cowan saw a flock of six birds—one in black-headed plumage, and four in winter plumage. Later in the day, three more flew down the lake.

COMMON TERN, *Sterna hirundo hirundo* Linnaeus.—Usually seen migrating southward toward the latter part of August. Three were seen circling about the lake on August 21, 1937. These birds remained for half an hour, only, and then continued to the southward. On the same day, a flock of fourteen passed down the lake, and on August 27 a flock of seventeen passed southward.

BAND-TAILED PIGEON, *Columba fasciata fasciata* Say.—A few of these birds now nest regularly between Nita and Alpha lakes, and are occasionally seen about these lakes. Three were seen flying across Nita Lake on July 26, 1927. Two pigeons were disturbed while feeding on berries by the side of the track at the foot of Alpha Lake, on September 29, 1944. Four were seen on August 11, 1937. On July 7, 1946, eight were seen on the side of Sproat Mountain. Two—a male and a female—were collected.

WESTERN MOURNING DOVE, *Zenaidura macroura marginella* (Woodhouse).—Mrs. Tom Neeland stated to the writer that, during the spring of 1945, a Mourning Dove remained about their farm at Mile 34, Pacific Great Eastern Railway.

DUSKY HORNED OWL, *Bubo virginianus saturatus* Ridgway.—Numerous and nests throughout the area. On June 19, 1924, a family of five was seen in dense timber above Nita Lake. One of these, collected about 5 p. m., proved to be a juvenile female. Its stomach contained the remains of a young varying here and a white-footed mouse. Another juvenile female was taken near by on July 1, 1941; the stomach of this bird was empty save for a single unidentified feather. An adult female, collected at Alpha Lake, August 17, 1946, had in its stomach remains of a squirrel and a large beetle.

COAST PYGMY OWL, *Glaucidium gnoma grinnelli* Ridgway.—Fre-

quently seen and heard about Alta Lake in fall and winter. Specimens taken were from Alta Lake, Alpha Lake, and Green Lake. Specimen No. 3,097 from Alta Lake is a male taken on September 29, 1944, and closely resembles *californicum*. I saw two Pygmy Owls at Pemberton on November 23, 1931. One of these was on a barn; the other, in the woods, followed me about as I whistled to it.

NORTHERN SPOTTED OWL, *Strix occidentalis caurina* (Merriam).—The call of this bird was heard on several occasions, but it was not until an adult female was taken in a weasel trap by a trapper near Mile 32, P. G. E. Railway, and sent in to the writer, that it was seen in the flesh. July 17, 1946, one of these birds was heard calling in late evening from the woods south of Alpha Lake.

LONG-EARED OWLS, *Asio otus wilsonianus* (Lesson).—Only seen in Pemberton Valley. An adult male was taken December 7, 1936. The stomach was empty except for unidentified feathers.

SHORT-EARED OWL, *Asio flammeus flammeus* (Pontoppidan).—Resident in Pemberton Valley. A pair was found dead by Mr. John Ronayne, Sr., on January 24, 1935, when the temperature was down to 30° below zero. These specimens were preserved, and are now Nos. 689 and 690.

SAW-WHET OWL, *Aegolius acadicus acadicus* (Gmelin).—Resident. It was heard about camp during the summer months. Specimens were received from Cheakamus Lake and Pemberton, having been found dead during late fall and winter. One was seen in a barn at Pemberton on November 23, 1931.

EASTERN NIGHTHAWK, *Chordeiles minor minor* (Forster).—Common every summer. All leave for the south by August 28.

BLACK SWIFT, *Nephoecetes niger borealis* (Kennerly).—On August 29, 1937, Mrs. Racey and the writer saw five Black Swifts flying southward during the afternoon. Cowan saw ten at Alta Lake on August 4, 1941; 12 on August 14; and two on September 2. I saw eight at Sproat Mountain on July 6, 1946.

VAUX'S SWIFT, *Chaetura vauxi vauxi* (Townsend).—A few seen each summer. On August 29, 1945, at 1:30 p. m., a flight of seventeen was seen near Alta Lake Station, heading southward.

RUFOUS HUMMINGBIRD, *Selasphorus rufus* (Gmelin).—A very common summer resident. A nest was found on the side hill above camp on December 28, 1945. The nest was near the end of a dead bough of a hemlock, about six feet above ground. The exposure was northwesterly, and while the nest was built on a dead branch, it was closely surrounded by live boughs. From the condition of the nest, it appeared to have been built during the current summer.

CALLIOPE HUMMINGBIRD, *Stellula calliope* (Gould).—One record only—a female taken at Alta Lake on July 29, 1932. It was identified by the late Dr. Joseph Grinnell.

WESTERN BELTED KINGFISHER, *Megaceryle alcyon caurina* (Grinnell).—A common summer resident over the whole district up to four years past; since then, somewhat scarce.

NORTHWESTERN FLICKER, *Colaptes cafer cafer* (Gmelin).—The common breeding Red-shafted Flicker. One of these birds was seen at Alta Lake on December 31, 1945.

COMMON RED-SHAFTED FLICKER, *Colaptes cafer collaris* Vigors.—An adult male of this subspecies was taken at Alta Lake, June 10, 1945—No. 3131.

NORTHERN PILEATED WOODPECKER, *Hylatomus pileatus abieticola* (Bangs).—A fairly common resident. Four young birds were seen about camp on August 9, 1932. Adult birds are frequently heard and seen.

NORTHERN RED-BREASTED SAPSUCKER, *Sphyrapicus varius ruber* (Gmelin).—A common summer resident and breeder. By mid-fall these sapsuckers move to lower altitudes near the sea, where many remain all winter.

HARRIS'S WOODPECKER, *Dendrocopos villosus harrisi* (Audubon).—Resident; breeds. A young male was taken at Alta Lake, July 4, 1921, and another on June 18, 1924.

BATCHELDER'S WOODPECKER, *Dendrocopos pubescens leucurus* (Hartlaub).—Casual in fall and winter. A male was taken December 18, 1935, at Alpha Lake, and a female was collected at Alta Lake, November 11, 1944.

GAIRDNER'S WOODPECKER, *Dendrocopos pubescens gairdneri* (Audubon).—Resident; breeds. Not common. An adult male was taken December 26, 1944.

ALASKA THREE-TOED WOODPECKER, *Picoides tridactylus fasciatus* Baird.—Uncommon but apparently breeds, as a young male was taken on August 16, 1937—No. 2301. On August 23, 1941, a female was taken by Dr. Cowan.

EASTERN KINGBIRD, *Tyrannus tyrannus* (Linnaeus).—A sight record only; one was seen near Rainbow Lodge, August 14, 1937.

HAMMOND'S FLYCATCHER, *Empidonax hammondii* (Xantus).—The most common breeding flycatcher in the region.

WESTERN WOOD PEWEE, *Contopus richardsonii richardsonii* (Swainson).—A common nesting bird.

OLIVE-SIDED FLYCATCHER, *Nuttallornis borealis* (Swainson).—Found breeding in all suitable localities from Pemberton to Maguire.

PALLID HORNED LARK, *Eremophila alpestris arcticola* (Oberholser).—Numerous at high elevations, and found nesting between 6,500 and 7,500 feet altitude.

VIOLET GREEN SWALLOW, *Tachycineta thalassina lepida* Mearns.—Not numerous but seen on several occasions. A pair of these swallows nested in the section bunkhouse in 1946. They have only been noted about Alta Lake since 1942.

TREE SWALLOW, *Iridoprocne bicolor* (Vieillot).—One was seen June 9, 1945, and two were noted on the 11th. These were flying over Alta Lake near a small island.

ROUGH-WINGED SWALLOW, *Stelgidopteryx ruficollis serripennis* (Audubon).—Four were seen June 11, 1945, near Alta Lake Station.

BARN SWALLOW, *Hirundo rustica erythrogaster* Boddaert.—Seen occasionally each year, but becoming more common. Six were seen near Alta Lake Station, August 27, and eight on the 29th, 1945. Of these, four were young birds being fed by the parent birds.

NORTHERN CLIFF SWALLOW, *Petrochelidon pyrrhonota pyrrhonota* (Vieillot).—Found nesting in an old barn at the north end of Alta Lake. Five were seen June 9, 1945, and one on the 10th.

GRAY JAY, *Perisoreus canadensis griseus* Ridgway.—Very common resident, and constantly seen about camp. It was noted that these jays frequently imitate the call of the Pygmy Owl.

STELLER'S JAY, *Cyanocitta stelleri stelleri* (Gmelin).—Abundant resident, but during 1943 it became scarce. However, since that time its numbers have increased. Specimens taken of some of these jays have shown intergradation with *annectens*. A nest with eggs was found by John Bailiff by the side of a stream behind Alta Lake Station.

NORTHERN RAVEN, *Corvus corax principalis* Ridgway.—Resident, and frequently seen and heard. It appears to be increasing in numbers. On December 25, 1945, a flock of ten was seen flying northward over Alta Lake.

NORTHWESTERN CROW, *Corvus caurinus* Baird.—Occasionally seen about Alta Lake, but very numerous about Pemberton Meadows where they nest.

CLARK'S NUTCRACKER, *Nucifraga columbiana* (Wilson).—Common resident, nesting at timberline. In June, 1924, two nests were found at an elevation of 6,000 feet. The parent birds were seen feeding the young.

LONG-TAILED CHICKADEE, *Parus atricapillus septentrionalis* Harris.—Resident; breeds. Both adults and young were seen on July 28, 1923, and specimens were taken.

OREGON CHICKADEE, *Parus atricapillus occidentalis* Baird.—Only

observed in winter time, when specimens were collected. Usually in company with kinglets.

GRINNELL'S CHICKADEE, *Parus gambeli grinnelli* (van Rossem).—Only met with above 3,000 feet elevation on Sproat Mountain. An adult male (No. 1134) was collected at Tenquil Creek, Pemberton, B. C., altitude 3,100 feet, on October 15, 1931.

CHESTNUT-BACKED CHICKADEE, *Parus rufescens rufescens* Townsend.—The most common of all four local chickadees, and flocks ranging from three or four to a dozen or more are frequently seen. For some unknown reason their numbers appeared to be very much reduced during 1945.

RED-BREASTED NUTHATCH, *Sitta canadensis* Linnaeus.—At one time quite numerous, but during the past six or seven years their numbers have seriously decreased. They now seem to be on the increase once more. Found from low levels up to timberline.

CALIFORNIA CREEPER, *Certhia familiaris occidentalis* Ridgway.—Nowhere common, but of constant occurrence.

DIPPER, *Cinclus mexicanus unicolor* Bonaparte.—Resident. Frequently seen feeding in the coldest weather along the streamlets which do not freeze over. A nest was found by J. Bailiff on a rocky ledge overhanging a waterfall on Mons Creek. The nest contained young which were fed by the parent birds while we were watching, on June 11, 1945.

WESTERN WINTER WREN: *Troglodytes troglodytes pacificus* Baird.—Common throughout the district.

NORTHWESTERN ROBIN, *Turdus migratorius caurinus* (Grinnell).—An extremely common bird that nests in every possible location about the lake shores. Found up to 6,000 feet elevation.

PACIFIC VARIED THRUSH, *Ixoreus naevius naevius* (Gmelin).—Common up to 6,000 feet. It breeds from 3,000 feet upwards, but the main nesting ground appears to be just above 5,000 feet, where a number were heard in full song the latter part of June, 1924.

DWARF HERMIT THRUSH, *Hylocichla guttata nanus* (Audubon).—Frequently found at high altitudes. It breeds from 1,800 feet upwards. A nest containing three eggs was found on a rocky ledge by Cheakamus River, on August 24, 1929. A male was collected on Sproat Mountain at an altitude of 4,400 feet on September 11, 1937. These thrushes were seen daily at this elevation; later they come to lower levels in migration.

RUSSET-BACKED THRUSH, *Hylocichla ustulata ustulata* (Nuttall).—The common nesting thrush of the lower levels. A few remain until September about the thickets surrounding the lakes.

WESTERN BLUEBIRD, *Sialia mexicana occidentalis* Townsend.—Not as common as formerly, and now only occasionally seen. On June 18, 1924, a pair of these birds nested on a tall cottonwood tree, on what was known as the Archibald ranch.

MOUNTAIN BLUEBIRD, *Sialia currucoides* (Bechstein).—A male was seen on the east side of Alta Lake, June 18, 1924. Several were seen at Alpha Lake in early June, 1924, by Dr. A. G. Naismith. On June 22, 1924, a male was seen on the telephone wire near Green Lake, and appeared to be feeding young. A section man mentioned that during the latter part of April, 1924, he had seen a large flock of these bluebirds near Green Lake, and that recently he had seen a pair feeding young.

On August 2, 1928, a nest was found containing four young. The nest was situated in an old decayed spruce stump about five feet from the ground. Young were being fed by the parents, and were almost fully fledged. This nest was in the third valley on Mount Whistler, at an altitude of about 6,000 feet.

TOWNSEND'S SOLITAIRE, *Myadestes townsendi* (Audubon).—Occasionally seen about Alta and Nita lakes, in both summer and winter. On December 29, 1945, when walking down the track near Nita Lake, the writer saw a Townsend's Solitaire fly to the top of a dead stub, whence it flew up the mountainside into the thick woods. This bird was again seen the following day. At this time, the snow was about four feet deep.

WESTERN GOLDEN-CROWNED KINGLET, *Regulus satrapa olivaceus* Baird.—Very abundant, both in summer and winter, and often in company with chickadees.

WESTERN RUBY-CROWNED KINGLET, *Regulus calendula cineraceus* Grinnell.—Frequently seen during the summer months, and heard in full song.

WESTERN PIPIT, *Anthus spinoletta pacificus* Todd.—Common, and breeds above 6,000 feet elevation. Occasional flocks are seen at lower levels about the railway tracks in the fall. A nest containing five eggs was found in the grass under the edge of a boulder at 7,000 feet, on June 26, 1924. The eggs were half incubated.

BOHEMIAN WAXWING, *Bombycilla garrulus pallidiceps* Reichenow.—Not very common, but seen in flocks during January, 1937. A nest containing young was found by Dr. Cowan on August 9, 1941. The female was seen feeding large young. The nest was situated about 30 feet above ground on the end of a branch of a tall hemlock, overhanging the water. Our clothesline was attached to the nesting tree, and its use did not disturb the birds.

CEDAR WAXWING, *Bombycilla cedrorum* Vieillot.—Very common; nests. Both adults and young have been seen each year. Flocks of twenty-five to thirty are of frequent occurrence.

RED-EYED VIREO, *Vireo olivaceus* (Linnaeus).—One of these birds was seen at Archibald's ranch on June 8, 1945.

WESTERN WARBLING VIREO, *Vireo gilvus swainsonii* Baird.—Quite a common bird; nests. Three were seen on June 9 and again on June 10, 1945.

CALAVERAS WARBLER, *Vermivora ruficapilla ridgwayi* van Rossem. —Found nesting in a willow swamp north of Pemberton Station, where twelve of these birds were seen. A juvenile female was taken at Alta Lake by Dr. Cowan on August 18, 1938.

ALASKA YELLOW WARBLER, *Dendroica petechia rubiginosa* (Pallas). —A common breeding bird up to 3,000 feet elevation: Pemberton, June 22, 1924—3; Alta Lake, August 9, 1937—3; Alta Lake, June 29, 1941—6 (a breeding female taken); Alta Lake, June 9, 1945—5 (and then daily).

AUDUBON'S WARBLER, *Dendroica auduboni auduboni* (Townsend).—Not common. At Alta Lake, on June 29 and 30, 1941, two pairs were seen each day on the Archibald ranch, and others seen at 21 Mile Creek near Rainbow. A small flock was seen on Mt. Whistler on August 2, 1928, at an altitude of 6,000 feet. Four were seen on August 11 and again on August 27, 1944, by Dr. Cowan.

BLACK-THROATED GRAY WARBLER, *Dendroica nigrescens* (Townsend).—Seen at Pemberton on June 22, 1924. A young male was taken by Dr. Cowan at Alta Lake on August 18, 1938.

TOWNSEND'S WARBLER, *Dendroica townsendi* (Townsend).—Seen at Nita Lake on July 1, 1922; altitude 2,500 feet. These birds apparently nest about the district. I collected an adult female on August 23, 1937, and on September 16 a juvenile male which came to a Pygmy Owl call. On June 29, 1941, a nesting pair was seen by the lake shore near camp. Three were seen in migration on August 23, and four on September 11, 1937. Six were seen by Cowan on August 24, 1944. Three were seen on a hillside near Nita Lake, June 10, 1945, and two on the side of Sproat Mountain, August 18, 1941.

MACGILLIVRAY'S WARBLER, *Oporornis tolmiei* (Townsend).—Very common up to 2,500 feet elevation. A nest was found on June 16, 1923, situated in a red osier bush about 15 inches above ground, by the side of Mons Creek, Alta Lake. The nest contained three eggs. Between June 29 and July 1, 1941, ten pairs of these birds were seen in the thickets surrounding the lakes and streams. Eleven, all apparently nesting birds, were seen on June 9, 1945.

WESTERN YELLOW-THROAT, *Geothlypis trichas occidentalis* Brewster. —Very numerous, especially about the north end of Alta Lake, in the hardhack and other brush that grows so abundantly in that swampy area.

NORTHERN PILEOLATED WARBLER, *Wilsonia pusilla pileolata* (Pallas).—Frequently seen on hillsides and alder bottoms about lake margins. Two were seen in migration on August 28, 1945.

AMERICAN REDSTART, *Setophaga ruticilla* (Linnaeus).—Found nesting in a willow swamp at Pemberton on June 3, 1924; elevation 600 feet.

NORTHWESTERN RED-WING, *Agelaius phoeniceus caurinus* Ridgway. —Seen at the north end of Alta Lake and at Pemberton; breeds.

BREWER'S BLACKBIRD, *Euphagus cyanocephalus* (Wagler).—Individuals and flocks seen about Alta Lake each year. A flock of 21 was seen feeding on the track near a water tank, August 18, 1946.

WESTERN TANAGER, *Piranga ludoviciana* (Wilson).—Frequently met with up to 3,000 feet elevation; breeds. A nest was found on June 22, 1924, at Pemberton, about a mile north of the station. The nest, with young, was in a fir tree, about 30 feet above ground, and was placed near the end of the branch. I watched the parents feeding the young. The species is very common about Alta Lake.

BLACK-HEADED GROSBEAK, *Phencticus elanocephalus maculatus* (Audubon).—On June 30, 1941, at Mile 38.8 P. G. E. R. R., I heard a male singing, and after a little search, found the nest in dense bush. The nest was constructed of twigs and rootlets with two or three pieces of dry hay, and was situated seven feet from the ground in a small elderberry bush quite close to 21 Mile Creek. A singing male was seen and heard about camp on July 1 and 2, 1941.

WESTERN EVENING GROSBEAK, *Hesperiphona vespertina brooksi* Grinnell.—A pair nested just above the camp at Alta Lake in 1938, and both adult and young were seen. Two were seen December 27, 1945. A female was picked up on May 3, 1946, having been killed by striking a clothesline wire.

CALIFORNIA PURPLE FINCH, *Carpodacus purpureus californicus* Baird.—Not common. Three were seen at Pemberton, June 22, 1924—a male and two females. One was seen by Dr. Cowan at Alta Lake on August 8, and again on the 15th, 1941.

ROCKY MOUNTAIN GROSBEAK, *Pinicola enucleator montana* Ridgway. —An uncommon winter visitant; a number were seen during the month of December, 1935. Three, two males and a female, were collected on December 27, 1935. On examination, the stomachs of these birds were found to contain the following:

No. 423 Male—75% gravel, 25% wood chips.
No. 424 Male—50% white gravel, 50% wood chips.
No. 425 Female—50% white gravel, 50% ground seeds—probably of conifers.

HEPBURN'S ROSY FINCH, *Leucosticte tephrocotis littoralis* Baird.—Flocks were seen on the side of Red Mountain on June 25, 1924; altitude 6,200 feet. Seen at 7,000 feet elevation on Mt. Whistler on August 2, 1928. Both adult and young birds were seen about the snow fields above Tenquil Valley, Pemberton, B. C., on July 21, 1930; altitude 7,500 feet. Two juveniles were collected there.

COMMON REDPOLL, *Acanthis flammea flammea* (Linnaeus).—A winter visitant only at Alta Lake, where flocks are seen from a dozen to more than 250. They appear to be very partial to the seeds of the Black Mountain alder which grows abundantly about the lake margin.

NORTHERN PINE SISKIN, *Spinus pinus pinus* (Wilson).—Resident and apparently breeds. Very abundant in winter when there is a good hemlock cone crop. Found to be numerous up to 6,000 feet altitude in June, 1924.

WILLOW GOLDFINCH, *Spinus tristis salicamans* Grinnell.—Breeds, but is a rather uncommon bird. A small flock was seen in migration on September 12, 1941. A breeding female was collected at Mile 38, June 30, 1941.

SITKA CROSSBILL, *Loxia curvirostra sitkensis* Grinnell.—Very common in good cone years. In July and August a flock was constantly about camp, feeding on hemlock cone seeds. In December, 1945, flocks of three to 50 or 60 were frequently seen. These birds were feeding on the seeds of cedar, hemlock and white pine, and were often in company with redpolls and Pine Siskins.

BENDIRE'S CROSSBILL, *Loxia curvirostra bendirei* Ridgway.—The foregoing remarks relating to the Sitka Crossbills are also applicable to this subspecies which we found abundant during the winter of 1945–1946. Specimens taken are of this race.

OREGON TOWHEE, *Pipilo maculatus oregonus* Bell.—Not common but occasionally seen in thickets bordering the lakes.

WESTERN SAVANNAH SPARROW, *Passerculus sandwichensis anthinus* Bonaparte.—Numerous from Avalanche Valley toward the main peak of Mt. Whistler, between 5,800 and 7,000 feet altitude. A breeding female was collected on Mt. Whistler on June 25, 1924, at an altitude of 5,800 feet. A young female was taken on August 28, 1932, at 6,650 feet. Frequently seen during fall migration along the railroad track bordering Alta Lake.

WESTERN VESPER SPARROW, *Pooecetes gramineus confinis* Baird.—Only very occasionally seen, and then in migration. A young male

bird was taken on the side of the railway embankment, September 3, 1927. On August 2, 1941, a juvenile was taken by Dr. Cowan.

SHUFELDT'S JUNCO, *Junco oreganus shufeldti* Coale.—A common summer resident, breeding up to 6,000 feet altitude, where a nest with four fresh eggs was found on June 25, 1924. A breeding female was taken at 5,700 feet altitude on Mt. Whistler, on June 24, 1924, and a juvenile female was taken at Nita Lake on July 1, 1941.

EASTERN CHIPPING SPARROW, *Spizella passerina passerina* (Bechstein).—Only met with at Pemberton, where a breeding male was taken June 22, 1924.

PUGET SOUND SPARROW, *Zonotrichia leucophrys pugetensis* Grinnell.—Only seen in migration. A specimen which proved to be a young male was secured on September 17, 1923, from a flock of about a dozen birds, all of which were young. On August 4, 1941, Dr. Cowan took a young one at Alta Lake.

GOLDEN-CROWNED SPARROW, *Zonotrichia coronata* (Pallas).—Common in migration, and breeding at high elevations. A young male was taken at an elevation of 6,500 feet on August 1, 1928, above Avalanche Pass, on Mount Whistler. These birds were found to be quite common about the 6,000-foot level on Mt. Whistler, August 1, 1928, and were still feeding the young. Several times the adult birds were heard in song at this late date.

ALBERTA FOX SPARROW, *Passerella iliaca altivagans* Riley.—Frequently seen in the month of September, during migration, and found breeding on the higher levels between 5,500 and 7,000 feet elevation on the surrounding mountains. They were quite common during the latter part of June, 1924, at the above elevations.

SOOTY FOX SPARROW, *Passerella iliaca fuliginosa* Ridgway.—Seen in migration only. A male was taken on September 12, 1937, at Alta Lake—No. 2322.

RUSTY SONG SPARROW, *Melospiza melodia morphna* Oberholser.—This is the common breeding bird, and is found throughout the district. It winters in limited numbers.

"YELLOW-HEADED SONG SPARROW, *Melospiza melodia inexpectata* Riley."—A wintering bird only. Specimens of this race (not accepted by the A. O. U. Check-List) have been taken in winter about Alta Lake.

SNOW BUNTING, *Plectrophenax nivalis nivalis* (Linnaeus).—A very uncommon winter visitant. An adult male was taken at Alta Lake, November 11, 1944.

Vancouver
British Columbia

NOTES ON THE LONGEVITY OF CAPTIVE BIRDS

BY KEN STOTT, JR.

BECAUSE the controlling factors are manifold in each case, longevity records of wild birds seldom indicate the length of life a physiologically 'normal' bird may attain if the conditions to which it is exposed are relatively ideal throughout its life. Disease, meteorological conditions, food shortages, the types of food obtained, predation and many other influences may all play a part in appreciably shortening its potential life span.

However, birds maintained under captive conditions are not exposed to predators, nor are they, theoretically at least, subjected to vicissitudes of weather and food supply. Hence, longevity records of captive birds may often be more indicative of the potential length of life of a species than are records of unconfined and unprotected birds.

The following data, gleaned from the files of the Zoological Gardens of San Diego, California, serve to supplement past compilations of a similar nature. Each record represents a specimen still living in the collection. However, the list is not to be considered a complete one, for in a collection which has included thousands of birds over a period of nearly thirty years, it has been more often than not impossible to account for individual specimens, particularly in such species as reproduce readily and prolifically in captivity. Furthermore, specimen records were poorly and sporadically kept during the early days of the zoo's existence.

The following list has been divided into sections, each consisting of those birds now in the collection received by the zoo during a given year. When more than one extant specimen of a species was acquired during the same year, the number of surviving examples follows the name. If no number is given, the name of each species represents a single bird. The list is comprised of specimens received from 1924 to 1940 inclusive. Since I submitted the present manuscript, two of the birds listed under date of 1927 have died as noted below. Date of final record, herewith, is May 25, 1948.

1924

KING VULTURE, *Sarcoramphus papa*
BATELEUR EAGLE, *Terathopius ecaudatus*

1925

BARRED OWL, *Strix varia helveola*

1926

DUSKY HORNED OWL, *Bubo virginianus saturatus*

1927

CAPE CROWNED CRANE, *Balearica pavonina regalorum*
KAGU, *Rhynochetos jubatus*[1]
LEADBEATER'S COCKATOO, *Kakatoe leadbeateri*
BARE-EYED COCKATOO, *Kakatoe s. sanguinea* (2)
SATIN BOWERBIRD, *Ptilinorhynchus v. violaceus*
PIPING CROW, *Gymnorhina t. tibicen*[2]

1929

ANDEAN CONDOR, *Vultur gryphus*
CHIMACHIMA, *Milvago chimachima*
FISHING OWL, *Ketupa k. ketupa*

1930

FRAZAR'S OYSTER-CATCHER, *Haematopus ostralegus frazari*
SILVER GULL, *Larus novae-hollandiae* (2)
SLENDER-BILLED COCKATOO, *Kakatoe tenuirostris*

1932

MARABOU STORK, *Leptoptilos crumeniferus*
GOLDEN EAGLE, *Aquila chrysaëtos canadensis*
BLUE-CROWNED CONURE, *Aratinga acuticaudata haemorrhous*
SENEGAL PARROT, *Poicephalus senegalus*

1933

BALD EAGLE, *Haliaeetus leucocephalus* (2)
GREAT BLACK COCKATOO, *Probosciger aterrimus*
JANDAYA CONURE, *Aratinga jandaya*
BLACK-HEADED CAIQUE, *Pionites melanocephala*
FISHING OWL, *Ketupa k. ketupa*

1934

WHITE-FACED GLOSSY IBIS, *Plegadis guarauna*
ANDEAN CONDOR, *Vultur gryphus*
SNOWY OWL, *Nyctea scandiaca*

1935

COMMON EMU, *Dromiceius n. hollandiae n. hollandiae* (2)
AUDUBON'S CARACARA, *Polyborus cheriway audubonii*
EAST AFRICAN CROWNED CRANE, *Balearica pavonina gibbericeps* (2)
CRESTED SERIEMA, *Cariama cristata* (2)
BOOBOOK OWL, *Ninox novaeseelandiae boobook* (2)

1936

NORTH AFRICAN OSTRICH, *Struthio camelus camelus*
COMMON CASSOWARY, *Casuarius casuarius*
COMMON EMU, *Dromiceius n. hollandiae n. hollandiae*
CRESTED SCREAMER, *Chauna torquata*
GALAPAGOS HAWK, *Buteo galapagoensis* (2)

[1] Died in February, 1948, after 20 years and 9 months in the zoo.
[2] Died in July, 1947, after 20 years and 2 months in the zoo.

INDIAN VULTURE, *Pseudogyps bengalensis*
GREAT BLACK COCKATOO, *Probosciger aterrimus*
CITRON-CRESTED COCKATOO, *Kakatoe sulphurea citrino-cristata*
LEADBEATER'S COCKATOO, *Kakatoe leadbeateri*
MOLUCCA COCKATOO, *Kakatoe moluccensis*
CLARK'S NUTCRACKER, *Nucifraga columbiana*

1937

AMERICAN WHITE PELICAN, *Pelecanus erythrorhynchos*
WHITE STORK, *Ciconia c. ciconia* (2)
BRUSH TURKEY, *Alectura lathami*
GALAPAGOS FINCH, *Geospiza* sp.

1938

PERUVIAN PELICAN, *Pelecanus occidentalis thagus* (3)
FRIGATE BIRD, *Fregata m. magnificens*
BOATBILL, *Cochlearius cochlearius* (2)
CRESTED SCREAMER, *Chauna torquata*
MAGELLAN GOOSE, *Chloephaga picta* (2)
KING VULTURE, *Sarcoramphus papa*
GOLDEN EAGLE, *Aquila chrysaëtos canadensis* (2)
GRIFFON VULTURE, *Gyps f. fulvus* (2)
SOUTHERN CARACARA, *Polyborus plancus* (2)
DUSKY GULL, *Larus fuliginosus* (2)
GALAPAGOS DOVE, *Nesopelia g. galapagoensis*
YELLOW-BILLED DOVE, *Columbigallina cruziana*
WHITE-EARED CONURE, *Pyrrhura leucotis*
ORANGE-FLANKED PARRAKEET, *Brotogeris pyrrhopterus*
TOVI PARRAKEET, *Brotogeris jugularis*
SPECTACLED OWL, *Pulsatrix p. perspicillata*
YELLOW-WINGED HONEY CREEPER, *Cyanerpes cyaneus*
ORANGE WEAVER, *Pyromelana franciscana*
RED-BILLED WEAVER, *Quelea quelea*
MARSH TROUPIAL, *Trupialis militaris*
POPE CARDINAL, *Paroaria dominicana* (2)
BRAZILIAN CARDINAL, *Paroaria cucullata*
HICKS'S SEEDEATER, *Spermophila aurita* (2)

1939

TIGER BITTERN, *Tigrisoma lineatum*
WILD MUSCOVY, *Cairina moschata* (3)
TAWNY HAWK, *Heterospizias meridionalis*
SCLATER'S CURASSOW, *Crax fasciolata sclateri* (2)
PILEATED GUAN, *Penelope pileata*
PAINTED QUAIL, *Excalfactoria chinensis*
SARUS CRANE, *Grus a. antigone*
RED RAIL, *Laterallus rubra*
PICUI DOVE, *Columbina picui*
BROWN-THROATED CONURE, *Aratinga pertinax aeruginosus* (2)
VENEZUELAN PARROTLET, *Forpus passerinus* (2)
RED-VENTED PARROT, *Pionus menstruus* (2)

FINSCH'S AMAZON, *Amazona finschi*
SNOWY OWL, *Nyctea scandiaca*
LESSON'S MOTMOT, *Momotus momota lessonii*
CRESTED CACIQUE, *Ostinops decumanus*
SILVER-BLUE TANAGER, *Thraupis cana* (2)
YELLOW-RUMPED TANAGER, *Ramphocelus icteronotus*
MAROON TANAGER, *Ramphocelus carbo* (2)
VENEZUELAN CARDINAL, *Richmondena phoenicea*

1940

SINGLE-WATTLED CASSOWARY, *Casuarius u. unappendiculatus*
MEDITERRANEAN PELICAN, *Pelecanus onocrotalus*
BLACK-BACKED HERON, *Ardeola speciosa*
GREATER ADJUTANT, *Leptoptilos dubius* (2)
BRAHMINY KITE, *Haliastur indus intermedius* (3)
CROWNED EAGLE, *Stephanoaetus coronatus*
PONDICHERRY VULTURE, *Sarcogyps calvus*
GREEN PEAFOWL, *Pavo muticus* (3)
MANCHURIAN CRANE, *Grus japonensis*
SILVER-NAPED CRANE, *Grus vipio* (2)
DEMOISELLE CRANE, *Anthropoides virgo* (4)
LAND RAIL, *Rallus philippensis* (2)
JAVAN PURPLE SWAMPHEN, *Porphyrio poliocephalus indicus* (4)
NICOBAR PIGEON, *Caloenas n. nicobarica* (4)
VICTORIA CROWNED PIGEON, *Goura victoria* (2)
CITRON-CRESTED COCKATOO, *Kakatoe sulphurea citrino-cristata* (2)
UMBRELLA-CRESTED COCKATOO, *Kakatoe alba* (2)
ALEXANDRINE PARRAKEET, *Psittacula eupatria nipalensis*
MOUSTACHED PARRAKEET, *Psittacula alexandri fasciata*
BLYTH'S HORNBILL, *Aceros plicatus subruficollis*
ASHY-CROWNED FINCH-LARK, *Eremopterix grisea*
FORMOSAN BLUE PIE, *Urocissa caerulea*
BLACK GORGETED JAY-THRUSH, *Garrulax pectoralis*
MALAYAN FAIRY BLUEBIRD, *Irena puella*
WHITE MYNAH, *Leucopsar rothschildi* (2)

Zoological Society of San Diego
San Diego
California

TAXONOMIC NOTES ON THE LAUGHING FALCON

BY PIERCE BRODKORB[1]

ON the basis of their large size and pale coloration, van Rossem (1938: 10) separated the laughing falcons of northwestern México as *Herpetotheres cachinnans excubitor*. The range of this form was stated to extend along the Pacific coast from Sonora to the Isthmus of Tehuantepec. Wetmore (1944: 36) united all Mexican and northern Central American examples under the name *Herpetotheres cachinnans chapmani* Bangs and Penard, on the grounds that the characters claimed for differentiation of a northwestern race were unstable. Farther south, Wetmore recognized *Herpetotheres cachinnans cachinnans* (Linnaeus), from Honduras to Perú and the Amazon Valley, and *Herpetotheres cachinnans queribundus* Bangs and Penard, from southern Brazil to Argentina. Recently van Rossem (1945: 61) reaffirmed the validity of *excubitor*.

Both van Rossem and Wetmore stated that there is no sexual difference in size, although neither author published measurements to substantiate this claim. My material confirms this conclusion. In a series from the District of Soconusco, Chiapas, the males have the wing 268–279 mm. in length, and the females, 268–276 mm. For birds from Paraguay the wing-measurements of the males are 276–292 mm.; of the females, 284–292 mm. Tail-length is not as reliable as wing-length, since the rectrices are often badly worn or abraded. Nevertheless there seems to be no sexual difference in tail-length. The tails of the Soconusco series measure 192–215 mm. in the males; 196–203 mm. in the females. For the Paraguayan birds the measurements are 213–221 mm. in the males; 214–230 mm. in the females. I have therefore combined the measurements of the sexes to allow the inclusion of non-sexed specimens.

As stated by others, this falcon undergoes a considerable amount of bleaching, so that it is necessary to make color comparisons between birds in the same stage of wear.

The present study was based on the examination of one juvenile and 71 adult specimens of the genus. I was particularly concerned with the status of the Mexican and Central American birds, and 55 of my specimens were from Middle America. During the course of the work it soon became evident that both size and color varied geographically, although as previously intimated the latter differences are often obscured by bleaching. When freshly molted feathers are compared, the geographic color differences are quite distinct.

[1] Contribution from the Department of Biology, University of Florida.

Along the Pacific coast of México, *Herpetotheres* is represented by large, pale birds. The wing-length is invariably 280 mm. or more in my sample. The large, pale race extends a little farther south along the coast than was originally thought for *excubitor*, since specimens from Tonalá and Pijijiapan, Chiapas, are similar to those from northwestern México. *Excubitor* also extends through the arid interior highlands of Chiapas and Guatemala and has been traced south to the highlands of Honduras. As is the case with certain other Pacific coast forms, it also occurs in the Motagua Valley of Guatemala. Wetmore's specimen from Progreso, with a wing of 307 mm., is from the heart of the Motagua Valley.

In southern Veracruz the population is variable. Five of the seven specimens from that state are large, but the other two are as small as the peninsular race. In coloration, Veracruzian birds are a little darker on the average than those from northwestern México. It appears to have been largely on the basis of the variability of the Veracruz birds that Wetmore placed *excubitor* in synonymy. In analyzing the Veracruz data presented by Wetmore (1943: 242) I find that three of his five specimens were large and the other two were small. Wetmore's specimens were examined during the present study; the smallest is considerably worn.

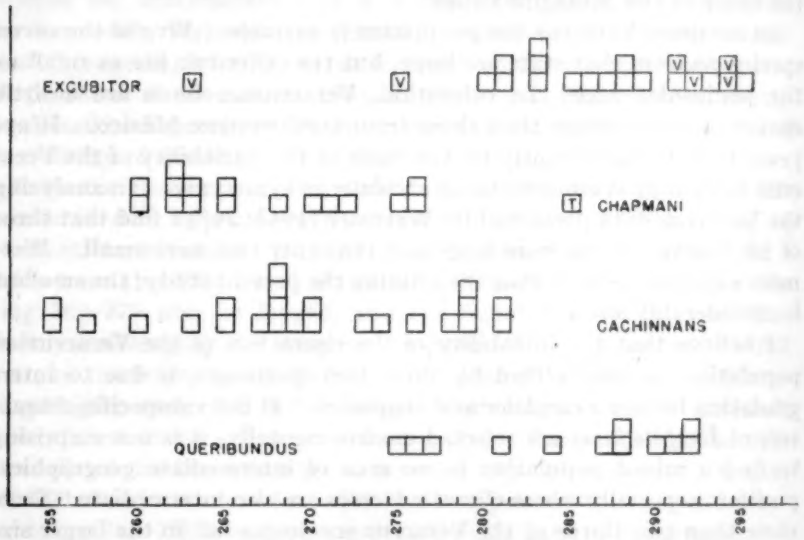
I believe that the instability of the characters of the Veracruzian population, as exemplified by these two specimens, is due to intergradation between *excubitor* and *chapmani*. If the subspecific characters of *Herpetotheres* are selected environmentally, it is not surprising to find a mixed population in an area of intermediate geographical position, especially where climatic factors are also intermediate. Since more than two-thirds of the Veracruz specimens fall in the larger size class, I intend to treat this intermediate population as atypical *excubitor*.

In the District of Soconusco, on the southeastern Pacific coastal plain of Chiapas, the population of laughing falcons consists of small and richly colored birds. In my series the maximum wing-length is 279 mm. I assume this race to be true *cachinnans*, although comparison with more adequate South American material might call for the separation of the Soconuscan birds. I have not seen enough specimens from northern South America to pass an opinion on the validity of *Herpetotheres cachinnans fulvescens* Chapman from Alto Bonito, western Colombia, nor on *Herpetotheres cachinnans maestus* Bangs and Noble from Bellavista, Perú. Wetmore placed both these names in the synonymy of *cachinnans*.

Herpetotheres cachinnans chapmani inhabits the Caribbean coastal

plain, from northern Chiapas south to Nicaragua. Here again the laughing falcons are small, but they differ from *cachinnans* in being paler colored, both on the dorsal surface and in the buffy coloration of the under parts. Except for one specimen from Tenosique, Tabasco, with a wing-measurement of 285 mm., the maximum wing-length in my series is 276 mm.

If 280 mm. is taken as the minimum wing-length for *excubitor*, on the one hand, and 279 mm. as the maximum for *cachinnans* and *chapmani* on the other, only five of my 55 Middle American specimens do not fall on the proper side of the line, even when Veracruz birds are included under *excubitor*. In view of these facts I believe that the action in synonymyzing *excubitor* was unjustified. My data indicate that it is more strongly differentiated than *queribundus* (Text-figure 1).



TEXT-FIGURE 1.—Wing-length (mm.) in the subspecies of *Herpetotheres cachinnans*. Each square represents one specimen. The letter V indicates a specimen from the state of Veracruz. The letter T indicates a specimen from Tenosique, Tabasco, discussed in the text.

The four races of the laughing falcon which I recognize currently are outlined below.

1. *Herpetotheres cachinnans excubitor* van Rossem. Type locality, Volcán de Colima, Jalisco. Size large (wing, 280–294 mm.; tail, 214–240); coloration of dorsal and ventral surfaces pale. Pacific coast of México, from Guirocoba, Sonora, south to Pijijiapan, Chiapas; crossing over the Isthmus of Tehuantepec to Veracruz and perhaps (sight

record) to southern Tamaulipas; south in the interior highlands through Chiapas (Chicomuselo) and Guatemala, including the Motagua Valley (Progreso and Quiriguá) to central Honduras (Escuela Agrícola Panamericana and Subirana).

MEASUREMENTS.—Wing: 280, 281, 281, 283, 283, 285, 286, 287, 288, 288, 289, 291, 293, 295; average of fourteen, 285.7 mm.

Tail: 206 (worn), 211 (worn), 214, 215, 219, 221, 222, 222, 225, 225, 226, 240; average of twelve, 220.5 mm.; average of ten, 222.9 mm.

Intergrades from Veracruz, wing: 263 (worn), 275, 283, 291, 292, 294, 294; average of seven, 284.7 mm.; average of six, 288.2 mm.

Intergrades from Veracruz, tail: 195 (worn), 215, 216, 219, 220, 232, 233; average of seven, 218.7 mm.; average of six, 222.5 mm.

2. *Herpetotheres cachinnans chapmani* Bangs and Penard. Type locality, Santa Lucía, Quintana Roo. Size small (wing, 260–276 mm.; tail, 193–212); coloration pale. Caribbean lowlands of Central America, from Aguacate, northern Chiapas, through the Yucatán peninsula, and south to the Río Escondido, Nicaragua.

MEASUREMENTS.—Wing: 260, 260, 262, 262, 262, 263, 263, 265, 265, 268, 270, 271, 272, 275, 276, 276, 285 (Tenosique); average of seventeen, 267.7 mm.; average of sixteen, 266.6 mm.

Tail: 190, 193, 198, 202, 204, 204, 206, 210, 211, 212, 212, 215, 218, 224, 227 (Tenosique); average of fifteen, 207.7 mm.; average of fourteen, 206.1 mm.

3. *Herpetotheres cachinnans cachinnans* (Linnaeus). Type locality, Surinam. Size small (wing, 255–281 mm.; tail, 190–216 mm.); coloration of dorsal surface more blackish brown, of ventral surface richer buffy. Both coasts of Central America, north on the Caribbean side to Costa Rica, on the Pacific side to Esperanza, Chiapas, and south in South America to northwestern Perú and the Amazon Valley.

MEASUREMENTS.—Soconusco, Chiapas, wing: 255 (molting), 257 (worn), 268, 268, 269, 270, 273, 274, 276, 279, 279; average of eleven, 269.8 mm.; average of nine, 272.9 mm.

Soconusco, tail: 189 (worn), 192, 196, 198, 199, 201, 203, 206, 212, 215, 215; average of eleven, 202.4 mm.; average of ten, 203.7 mm.

Costa Rica and Panamá, wing: 255, 260, 265, 268, 268, 270, 279, 281, 281; average of nine, 269.7 mm.

Costa Rica and Panamá, tail: 190, 201, 202, 209, 210, 214, 214, 216; average of eight, 207.0 mm.

Colombia, British Guiana, and northern Brazil, wing: 263, 265, 267, 278; average of four, 268.3 mm.

Colombia, British Guiana, and northern Brazil, tail: 197, 198, 201, 206; average of four, 200.5 mm.

4. *Herpetotheres cachinnans queribundus* Bangs and Penard. Type locality, Pernambuco, Brazil. Size large (wing, 276–292 mm.; tail, 213–230); coloration pale, apparently even paler than in *excubitor*. Southern South America, east of the Andes, from southern Brazil to northern Argentina.

MEASUREMENTS.—Wing: 275 (worn), 276, 277, 281, 284, 287, 288, 288, 290, 291, 292, 292; average of twelve, 285.1 mm.; average of eleven, 286.0 mm.

Tail: 198 (worn), 201 (worn), 204 (worn), 207 (worn), 210 (worn), 213, 214, 214, 215, 216, 221, 230; average of twelve, 211.7 mm.; average of seven, 217.1 mm.

The geographic differences shown by *Herpetotheres* are correlated with climatic conditions. The larger races inhabit, in general, areas of lower temperatures than the smaller races. The paler races are restricted to the more arid parts of the range. The similarity between the forms at the geographic extremes of the genus, *excubitor* and *queribundus*, is in contradiction to Jordan's Law.

LITERATURE CITED

VAN ROSSEM, A. J.

1938. Descriptions of three new birds from western Mexico. Trans. San Diego Soc. Nat. Hist., 9 (No. 4): 9–12.

1945. A distributional survey of the birds of Sonora, Mexico. Occ. Papers Mus. Zool. La. State Univ., No. 21: 1–379.

WETMORE, ALEXANDER

1943. The birds of southern Veracruz, Mexico. Proc. U. S. Nat. Mus., 93 (No. 3164): 215–340.

1944. A collection of birds from northern Guanacaste, Costa Rica. Op. cit., 95 (No. 3179): 25–80.

University of Florida
Gainesville
Florida

TWO NEW PERUVIAN HUMMINGBIRDS OF THE GENUS *COELIGENA*

BY JOHN T. ZIMMER

RECENTLY, in looking over certain Peruvian hummingbirds, I discovered that there was a notable distinction between examples of *Coeligena torquata insectivora* of central Perú and specimens from the northern part of that country heretofore referred to the same subspecies. The distinction is so marked that specific separation at first seemed possible, although fuller study dispelled this supposition. The new form may be known as follows.

Coeligena torquata margaretae, new subspecies

TYPE from La Lejia, north of Chachapoyas, Perú; altitude about 9000 feet. No. 234,391, American Museum of Natural History. Adult male collected March 13, 1925, by Harry Watkins; original No. 8992.

DIAGNOSIS: Male differs from the same sex of the other forms of the species by having two spots of metallic color on the top of the head, separated by a black line; the anterior spot smaller and more bluish, the posterior one larger and more greenish. Throat a little lighter and more broadly green than in *C. t. torquata* of Colombia and eastern Ecuador but not so broadly (on the malar region) as in *C. t. fulgidigula* of western Ecuador. Mantle more blackish than in *fulgidigula*, about as in *torquata*.

RANGE: Known only from the Central Andes of northern Perú, near Chachapoyas, and possibly south to the neighborhood of Tayabamba.

DESCRIPTION OF TYPE: Top and sides of the head largely velvety black with a faintly greenish gloss in certain lights; a small patch of glittering feathers in the center of the forehead varying from Ethyl Green[1] to Phenyl Blue according to the position of the light; separated from the frontal patch by a black line; in the center of the crown and anterior occiput a second, larger patch of glittering feathers, Emerald Green to Skobeloff Green, according to the position of the light; behind the eye a small white lunule; nape and mantle black (with faint greenish lights in certain positions; lower back and upper tail-coverts shining Dark Yellowish Green. Chin and anterior throat moderately glittering Wall Green, the feathers with concealed black subterminal areas and white bases; lower throat and chest occupied by a large triangular area of pure white extending laterally onto the sides of the neck; lower breast, sides, and belly black, with a dark green gloss that becomes pronounced on the flanks; under tail-coverts lighter green centrally, margined exteriorly toward the base with whitish; thighs white. Remiges purplish brown; with a narrow outer margin of the outermost primary brownish; upper wing-coverts shining Dark Yellowish Green. Tail forked; median rectrices dark green; remaining pairs white with green tips, narrowest on the submedian pair and broadest on the external pair, reaching farther basad on the outer margin than on the inner of these various feathers, most pronouncedly on the outermost. Bill (in dried skin) black; feet

[1] Names of colors are capitalized when direct comparison has been made with Ridgway's 'Color standards and color nomenclature.'

yellow; claws blackish. Wing, 80 mm.; tail, 47; exposed culmen, 34; culmen from base, 39; tarsus, 5.

REMARKS: Female not clearly distinguishable from the same sex of *torquata* and *fulgidigula*. The bill in the single topotypical female is as long as in the longest-billed male (exposed culmen 36 mm.) which is longer than in any specimen I have measured of *torquata* (34 mm.) or *fulgidigula* (35 mm.) and still longer than in *insectivora* (31 mm.), but a series of females would rather certainly show an overlap with these other forms as does the series of males (33–36 mm.).

It is very curious that this excellently marked north-Peruvian form has not previously received a name since its most striking character was noted many years ago. Tschudi's original description of his *Tr[ochilus] insectivorus* (Arch. Naturg., 10, pt. 1: 298, May, 1844—Perú [= between Huari and Chagacancha, Junín]) was based on a female or a young male and hence was of little diagnostic value, but Elliot (Ibis, 1876: 5) described the adult male plumage from a specimen from Chilpes, Junín. In spite of this account, Taczanowski (Orn. Pérou, 1: 389, 1884) in his discussion of *insectivora*, cited the reference to Elliot but described the bird I have named *margaritae*, presumably from a specimen collected at Huambo by Stolzmann, although he had earlier (*cf.* P. Z. S. London, 1874: 543) seen examples of the Junín bird from Pumamarca and Chilpes. Salvin (Cat. Birds Brit. Mus., 16: 128–129, 1892) also described the male of the more northern form. Berlepsch and Stolzmann (P. Z. S. London, 1902: 23) noted part of the differences between Huambo and Junín specimens but referred both to *insectivora*. Simon (Novit. Zool., 9: 180, 1902) discussed a male from Compan which had the frontal spot of *margaretae*, but he thought that it was a character of the fully adult plumage of *insectivora*.

However, I have four males from the Junín region, including the specimen described by Elliot, and three are fully adult and quite distinct from *margaretae*. One of them has a single blue feather on the forehead; the others have no trace of the marking that is so prominent in *margaretae*. Furthermore, they are otherwise dissimilar. The green of the throat is as broadly expanded as in *fulgidigula*, the lower under parts are green rather than black, the mantle likewise is green with a black shading apparent only in certain lights instead of the reverse, the coronal patch averages lighter green than in *margaretae*, and the bill is shorter as noted above. There is no question that two forms are involved.

The records from Huambo and Compan undoubtedly belong to *margaretae*, as do those from Ray-Urmana, "Sorritos" [= Sorritor],

and Uchco. A female from Utcubamba, kindly lent by Mr. R. M. deSchauensee of the Academy of Natural Sciences of Philadelphia, is unassignable by itself, but the proximity of the locality to Compan assures its reference to *margaretae*.

I have a young male from Chaupe, Perú, north of the Marañón, which is similarly unidentifiable without adult males from the same locality, but the proximity of the place to Loja, Ecuador, whence I have an adult male of *C. t. torquata*, suggests the assignment of the Chaupe bird to the typical form.

This Loja bird has a few frontal feathers finely tipped with blue and the coronal feathers, although their broad tips are violaceous as in normal *torquata*, have a suggestion of greenish blue subterminally. Both features indicate intermediacy between *torquata* and *margaretae*. Occasional other specimens of *torquata* and *fulgidigula* have a bright feather or two on the front, but nothing like the pronounced patch shown by *margaretae*.

I believe that *inca* should be united specifically with the *torquata* group. The most striking character is the rufescent instead of white pectoral area, but the feathers are rufous only at their tips beneath which the white of the *torquata* group is still present. The general plumage is more clearly green and more glittering than in the other forms, but *insectivora* is intermediate in that respect. It also has a frontal spot but lacks the coronal one, in which respect *margaretae* is intermediate, having both these spots.

In examining the available series of *inca* I discovered certain differences between Peruvian and Bolivian examples which I believe justify the recognition of two rufous-breasted forms instead of one. Additional material, kindly lent by Mr. R. M. deSchauensee of the Academy of Natural Sciences of Philadelphia, confirms the distinction. Since the type locality of *inca* is in northern Bolivia (Coroico), it is the Peruvian population that must be named. It may be known as follows.

Coeligena torquata omissa, new subspecies

TYPE: from Huaisampillo ["Huasampilla"], southeastern Perú; altitude 9000 feet. No. 37,550, American Museum of Natural History. Adult male collected in April, 1872, by Henry Whitely.

DIAGNOSIS: Nearest to *C. t. inca* of northern Bolivia, but differs in the male sex by more pronounced green on the throat, a more evident green tinge (in certain lights) on the sides and top of the head, a somewhat bluer (less greenish) frontal patch, a very slightly lighter average hue of rufous on the breast, and somewhat darker green back and

lower under parts. Females not certainly distinct from those of *inca*, but with the average hue of rufescence on the breast a little lighter.

RANGE: Southeastern Perú, in the Urubamba Valley and the Marcapata District.

DESCRIPTION OF TYPE: Top of head deep black, with a noticeable green gloss in certain lights; center of forehead with a glittering patch of color varying from Vivid Green to Oxide Blue (with traces of Dark Violet in certain lights); back shining green, near Cossack Green, passing into a lighter and somewhat more golden hue on the upper tail-coverts. Sides of head like the crown, with a similar greenish gloss visible in certain lights but with a strongly green area on the sides of the neck, merging into the green of the mantle; chin and throat black with pronounced dark green centers on the feathers; upper breast and sides crossed by a broad band of Sanford's Brown (the concealed subterminal portions of the feathers white); rest of under parts of body dark glittering green with strong bluish reflections in certain lights; under tail-coverts dark green without pronounced glitter; thighs white. Remiges Olive-Brown, with outer margin of outermost primary paler; upper and under wing-coverts like the back. Median rectrices near Krönberg's Green with a golden tinge most evident apically; remaining pairs white with broad green tips, narrowly extending basad along the inner margins and more broadly so on the outer margins of the outermost pair. Bill (in dried skin) blackish; feet yellowish, with claws dusky brown. Wing, 79 mm.; tail, 48.5; (bill broken at tip); tarsus, 5.

REMARKS: Adult females have the throat rufescent like the breast and the top of the head green like the back, with the glittering frontal patch sometimes slightly suggested. The pattern of the tail is different from that of the males. On the outermost rectrices, the outer margin is blackish well basad, broadening gradually to reach the shaft near the tip but usually not rounding the tip to the inner web; on the next pair, this stripe is narrower and shorter but the terminal margin of the inner web may be dusky; on the submedian pair, the outer border of the outer web is again heavier and greenish, the tip of the web is broadly dull green, and most of the inner web is similarly greenish well basad; the third pair from the outside is the most variable and sometimes is like the subexternal, sometimes like the submedian feathers. This difference in the tails of the two sexes appears to be more pronounced in *inca* and *omissa* than in the more northern forms of the species, but some examples of the latter show a definite amount of the same condition.

The green markings on the throat of *omissa* and the greenish sheen

obscurely seen on the crown I believe are to be considered as definite trends in the direction of *insectivora* whose green belly and back represent an intermediate condition between *margaretae* and *omissa*. The position of the frontal patch is the same in *margaretae* and *omissa* (and *inca*), just as the placement of the coronal patch is the same in *margaretae* and *insectivora*. The rufous pectoral area of *omissa* and *inca* is the only notable character distinguishing these two forms from the *torquata* group, and since the breast of these forms is still white back of the rufous tips, the character seems hardly of specific value. I have no hesitation, therefore, in broadening the concept of the *torquata* group to include these two southern forms.

In addition to the localities for the material at hand, records of *margaretae* are from Huambo, Uchco, Ray-urmana, Sorritor ["Sorritos"], and Compan.

Records of *insectivora* are from Maraynioc, Puyas-yacu ["Tuyas-yacu"], Pumamarca, and between Huari and Chagacancha.

Records of *omissa* are from Cuzco and Torontoy.

SPECIMENS EXAMINED

C. t. conradii.—

VENEZUELA:

(Mérida, Culata, Nevados, Conejos, Montañas Sierra, and "Venezuela"), 21 ♂, 14 ♀, 3 (?).

C. t. torquata.—

COLOMBIA:

(El Roble, El Pinón, Santa Elena, Subia, El Eden, La Florida, Cerro Munchique, Cocal, west of Popayán, Medellin, above Salento, and "Bogotá"), 10 ♂, 16 ♀.

ECUADOR:

(Ambato, above Baeza, upper Sumaco, Zuñac, Papallacta, Cuyuja, Loja, and "Ecuador"), 13 ♂, 5 ♀.

PERÚ:

Chaupe, 1 ♂.

C. t. fulgidigula.—

ECUADOR:

(Gualea, Guamino, Lloa, Pichincha, Pallatanga, near Mollituro, Quito, and "Ecuador"), 20 ♂, 11 ♀.

C. t. margaretae.—

PERÚ:

La Lejia, 6 ♂ (incl. type), 1 ♀;
Utcubamba, 1 ♀[1].

[1] Specimens in Academy of Natural Sciences, Philadelphia.

C. t. insectivora.—
PERÚ:
Chilpes, 2 ♂;
Culumachay, 1 ♂;
Tambo de Aza, 1 ♂.
C. t. omissa.—
PERÚ:
Huaisampillo, 3 ♂ (incl. type), 1 ♀;
Limbani, 1 ♂, 1 ♀;
below Limbani, 2 ♂;
Oconeque, 3 ♂[1], 3 ♀[1], 1 ♀;
Urubamba Cañon, 1 ♂;
Santa Rita, 2 ♂;
San Miguel, 1 ♂.
C. t. inca.—
BOLIVIA:
Cillutincara, 2 ♂, 1 ♀;
Nequejahuira, 2 ♂;
Chaco, Yungas, 4 ♂, 1 (?);
Incachaca, 2 ♀[1], 1 (?).

American Museum of Natural History
New York, N. Y.

PROBABILITY IN SUBSPECIFIC IDENTIFICATION OF SINGLE SPECIMENS

BY A. L. RAND

INTRODUCTION

POPULATIONS, represented in museum collections by series of specimens, are the proper units in the study of geographical variation. This study, with some of its formal presentations—the naming of subspecies, the allocation of specimens, and the outlining of ranges—deals with the average characters of populations. But occasionally an individual specimen, because of its characters and its geographical origin, demands special consideration. Sometimes it is the only specimen from a wide area. In such a case there is little to do but assess its characters, and identify it subspecifically accordingly. The assumption is made that its characters are normal or average. But sometimes, from an area well represented in the collection, there comes a specimen that in appearance accords better with the average

of some other subspecies than with the average of the subspecies that usually occurs where it was taken. The correct evaluation of such specimens is important, for on them is based such conclusions as known range of variation, extent of casual geographical occurrence, and formal entries in faunal lists.

Such specimens admit of two quite different interpretations. The first is that they are actually far wanderers from their normal ranges. The second is that they may belong to the subspecies that usually occurs in that region, but through individual variation approach more closely in appearance the average of some other subspecies than their own.

WANDERERS

The first class of phenomena—that individuals may wander far from their usual range—is amply documented. The Western Tanager (*Piranga ludoviciana*) has been taken in Quebec, the Scissor-tailed Flycatcher (*Muscivora forficata*) at James Bay, the Scarlet Tanager (*Piranga erythromelas*) at Point Barrow, the Black-billed Cuckoo (*Coccyzus erythropthalmus*) and the Sora (*Porzana carolina*) in Great Britain, the Old World Fieldfare (*Turdus pilaris*) in the Canadian Arctic, and the White Wagtail (*Motacilla alba*) in Quebec. Taverner (Auk, 59: 235, 1942) has even suggested that horned owls of one race may occasionally breed in the normal range of another. Some records of accidental occurrence outside of the range of the species have proved to be referable, not to the nearest known subspecies, but to a more distant one. The Melancholy Kingbird (*Tyrannus melancholicus*) recorded on Vancouver Island and in Maine proved to belong to the subspecies *T. m. chloronotus* of southern México and southward, rather than to the race *T. m. couchii* which occurs in the southern United States (A. O. U. Check-List of North American Birds, ed. 4: 202, 1931), and the Solitary Sandpiper (*Tringa solitaria*) recorded from the arctic coast of Alaska proved to be *T. s. solitaria*, the southern subspecies, rather than the more northern *T. s. cinnamomea* (Conover, 1944: 539).

Grinnell (1922: 373–380), in his article on the role of the accidental, has even postulated that "accidentals" are not accidental but the rule (though this seems like another way of saying that accidents will happen), and that the far wandering of individuals is part of the ordinary evolutionary program.

Thus there is nothing impossible in a specimen that looks more like some far distant subspecies rather than the one of usual occurrence where it was taken, actually being a far-wandering example of the subspecies it resembles.

VARIANTS

The second possible explanation of a non-conforming specimen is that it is an extreme variant of the local population. This is well known, but it is less widely accepted, and should be more often considered in making or evaluating any identifications.

The differences between subspecies often are only average ones. It is a currently accepted convention that if seventy-five per cent of the individuals of a sex or age class are identifiable by means of 'characters,' the subspecies be considered valid. It is not necessary that the unidentifiable twenty-five per cent be intermediates; individually their characters may overlap widely and approach the average characters or even the extremes of some other subspecies.

Unusually plumaged birds are not at all uncommon. Excessive paling or darkening of plumage is perhaps the most common, but other variations giving unusual patterns for the species have been recorded, and it sometimes happens that such a mutant may resemble, to a greater or lesser extent, the condition in another species; thus Wetmore (1931: 33) mentions Black-capped Chickadees (*Parus atricapillus*) and Carolina Chickadees (*P. carolinensis*), both normally with a wholly black crown, that had white feathers on the side of the crown, in the areas where a related species, the Mountain Chickadee (*Parus gambeli*), always has a white stripe.

Glover Allen (1914: 558) calls attention to various sparrows such as the Song and the Lincoln Sparrow (*Melospiza melodia*) and (*M. lincolnii*) that normally do not have white outer tail feathers, as having them, recalling the normal condition in some other sparrows such as the Junco (*Junco hyemalis*) and Vesper Sparrow (*Pooecetes gramineus*). Swarth (1913: 22) has shown the extreme variation in the white collar and the black throat bar in the Canada Goose (*Branta canadensis*). Also inthe National Museum of Canada is a Canada Goose head that closely follows the color and pattern of that of the Barnacle Goose (*Branta leucopsis*).

Harrison (1946: 69) reports on two aberrant specimens of the Robin (*Erithacus rubecula*), taken in England, that show a character in color distribution very similar to that of the related Japanese Robin (*Luscinia akahige*).

Mayr (1942: 81) has shown that a chestnut belly may appear in an island race of the flycatcher, *Monarcha castaneoventris*, which is usually all black, while another, distant island race of the same species, that usually has a chestnut belly, occasionally may have entirely black individuals.

Thus extreme variants may occur. They sometimes approach the normal condition in some other race or species. This tendency to repeat a condition occurring elsewhere has been attributed to a latent potentiality, or to the basic potentialities of related forms tending to be similar and with mutational channels more or less prescribed (*see* Mayr, 1942: 74).

These extreme variants are just as much parts of their local populations and the subspecies to which they belong as are the individuals that show characters near the average of the subspecies, and should be so named.

PRINCIPLE OF PROBABILITY

Confronted with the task of identifying a non-conforming individual —one that more nearly resembles the average of another population— the two alternatives given above must be considered. In some cases one, in some the other, alternative will be correct. Which one to adopt must be decided on the basis of probability, after considering all the factors.

Identification by probability is commonly used by field observers. It is well illustrated by the case of the Blue-winged Teal (*Anas discors*) in eastern North America. Few field students that see in the East a bird that looks like a female Blue-winged Teal, hesitate to call it a Blue-winged Teal. But it would be indistinguishable in the field from a female Cinnamon Teal (*Anas cyanoptera*), and the latter species has been recorded as far east as New York and Florida. The specific identification of female Blue-winged Teals in the East is purely on probability. Persons working with skins in the laboratory also use this principle of probability. It is well illustrated by the case of the European and the American Green-winged Teals (*Anas crecca* and *Anas carolinensis*).[1] The males are quite distinct. But the females are alike in every respect except one; in *A. carolinensis* in all sexes and ages the anterior buff wing-bar is usually of a richer color, especially in the outer half of the bar; in the European bird this bar is almost always very pale buff or pure white, especially at the outer end. Probably nine out of ten specimens can be placed correctly by this character alone (Phillips, 1923: 232). The point to be made is that an American bird, with a pale or white anterior wing-bar is not necessarily *A. crecca*. In the National Museum of Canada there is such a specimen from Wood Buffalo Park, and I consider it *carolinensis*. But it is possible that it is *crecca*, as there are many American records of the latter, just as there are records of *carolinensis* in Europe (pre-

[1] Whether they are considered species or subspecies is immaterial here.

sumably based on males that can be recognized with certainty). Here we come to the principle of probability; a species (or subspecies) is identified on probability, even against the evidence of the average morphological characters. But when strays are taken in Greenland, where either *A. crecca* or *A. carolinensis* is to be expected, and probability is thus even, it becomes necessary to identify the females by morphological characters with a nine to one chance of being right, and this is what Hørring and Salomonsen have done (1941: 7).

Another case of the principle of probability being used by a taxonomist is with the Spruce Grouse (*Canachites canadensis*). In the two subspecies, *C. c. canadensis* and *C. c. canace*, the females are fairly distinct, but the males are inseparable. Yet Uttal, in his review of the species (1939: 460–464), in listing material, refers males to subspecies on the basis of their origin with the ranges determined by a study of the females.

In considering probability, a number of factors may afford a clue. The normal and extreme ranges of known variation in the species and subspecies must be ascertained. If the non-conforming specimen falls outside this it may be a new record of extreme variation for that form. To decide that, the known variation in other species must also be considered. Another factor that may be indicative is the place of origin and the habit of the birds concerned; Red Crossbills (*Loxia curvirostra*), for example, are more likely to wander than Spruce Grouse. The season of occurrence may also be indicative.

Some British ornithologists have adopted the latter of the two alternatives given above in regard to accepting apparently widely wandering examples of a subspecies as such. For example, the common Starling of Britain is *Sturnus vulgaris vulgaris*, with a greenish metallic head. There occur in the British Isles, in winter at least, and not very uncommonly, individuals with a purplish gloss on the head. These purple-headed Starlings resemble a Siberian race (*S. v. poltaratskyi*) and have been identified as wandering examples of that race by some authorities. However, Tucker (1945: 36–38) reports that there are intermediates between the purple and green-headed birds, and prefers to consider the British-taken purple-headed birds as variants of the nominate race which more or less closely resemble the Siberian race. Another similar case was reported by Harrison (1944: 58–60). The Greenland Mallard (*Anas platyrhynchos conboschas*), is resident in Greenland, to which it is confined. It differs from the common Mallard (*A. p. platyrhynchos*), of the British Isles, in a variety of characters, including grayer upper parts, scapulars and wing-coverts; flanks more coarsely vermiculated and with more gray and

white contrast; the chest shield marked with black; and size slightly larger (wing, 280–295, against 256–278 mm.). Harrison had three British-taken specimens that showed the color characters of the Greenland race; two were somewhat small, but the third also matched the Greenland race in size. However, Harrison considered all three birds aberrant specimens of *A. p. platyrhynchos*. In the United States, Aldrich evidently had the same idea in mind in his review of the Bob-white (*Colinus virginianus*) when he listed a number of out-of-range specimens with a footnote to the effect that they were either aberrant local birds or introduced examples of another subspecies (1946: 493–508).

Below I have summarized a number of examples of identification of aberrent specimens that have come to my attention while working on variation in Canadian birds. Most cases have been identified as variants, extending the known range of variation of the forms concerned; a few have been identified as belonging to the subspecies they most resemble, extending the known geographical range of the subspecies.

EXAMPLES OF CONTINUOUS INDIVIDUAL VARIATION

These examples are cases in which variation is continuous, with the extremes connected with the average by intermediates.

SPRUCE GROUSE (*Canachites canadensis*).—The subspecies from southern Ontario southward and eastward, *C. c. canace*, is richer and browner in the female than the subspecies *C. c. canadensis* which ranges from Labrador to northern Alberta. The females are variable, and though the average difference between the above two subspecies is good, individual specimens may depart widely from the average of a population. Thus 17 females from Wood Buffalo Park (northern Alberta and Mackenzie District) are rather clearly referable to *canadensis*, as one would expect. But the eighteenth specimen is much browner and richer in color, and taken by itself compares much better with many *canace* from southern Ontario. There is little doubt that this *canace*-like bird from the range of *canadensis* belongs with the rest of the local population, and should be considered as belonging to the subspecies *canadensis*, in spite of the fact that it looks more like *canace*.

PILEATED WOODPECKER (*Ceophloeus pileatus*).—The eastern subspecies, *C. p. abieticola*, which ranges from Nova Scotia to northern Alberta at least, is fairly distinct on the average from the western race of southern British Columbia, *C. p. picinus*, in the larger bill, and in the well-developed white spots on the tips of the longest pri-

maries (other described characters are not evident in the Canadian National Museum material). However there are two birds in the eastern series (one from New Brunswick and one from Ontario) without any white on the primaries. Through individual variation they equal the most distinctively marked *picinus* in this character. The bill size is not distinctive in these two specimens, since it falls into the range of overlap. It is improbable that these two eastern birds are actually *picinus;* they rather must be considered to be *abieticola*, overlapping *picinus* by individual variation. With the probability from known ranges in mind, there is little doubt in this case. The case would be otherwise if both subspecies migrated to a common wintering ground and had to be identified there; then the two eastern specimens mentioned above, referred to *abieticola* on geographical probability, would almost surely have been identified as *picinus*.

AMERICAN ROBIN (*Turdus migratorius*).—The black-backed subspecies (*T. m. nigrideus*) is known to range over Newfoundland and the eastern part of the Labrador Peninsula and migrate through the Maritime Provinces. It is characterized by being generally darker with a blacker back than the common Eastern Robin (*T. m. migratorius*) which ranges at least from Nova Scotia and southwestern Quebec to Yukon. But through the courtesy of Mr. R. W. Tufts, I have seen one breeding Nova Scotia bird that is identical with *nigrideus* in appearance, and in the large series of birds in the National Museum of Canada from the breeding range of *migratorius*, there are individual specimens from western Ontario, Manitoba, and northern Mackenzie that are inseparable from Newfoundland material. These specimens are extremes of individual variation, and must be called *migratorius* despite their resemblance to *nigrideus*.

The weight of deciding evidence in the Nova Scotia specimen comes, of course, from its season of occurrence. If it had been taken earlier during the season of migration it would probably have been referred to *nigrideus*.

The identification of *nigrideus* from the Maritime Provinces must take season into account in considering probability. Additional evidence would be supplied by data on the proportion of Black-backed Robins present. When, during migration, the proportion of *nigrideus*-like birds increased, it could safely be assumed that they were actually *nigrideus*.

With the discovery that occasional *nigrideus*-like individuals breed as far west as the Mackenzie, it is obvious that when they migrate southward they may be mistaken for actual wandering *nigrideus*. For a final decision as to their identity, geographical probability must

be considered, and western records of *nigrideus* must be viewed with suspicion.

HAIRY WOODPECKER (*Dendrocopos villosus*).—On Vancouver Island there is a dark subspecies (*D. v. harrisi*), and on the Queen Charlotte Islands a still darker, blacker race with a reduced amount of white in several parts of its plumage (*D. v. picoideus*) represents the species. The adults in our series are all identifiable by physical characters. But this is not the case with the immatures; of our seven immature, fall-taken *harrisi*, five have some of the characters of *picoideus*, and one, at the dark end of the scale of individual variation, on a combination of characters falls well within the range of variation of our five immature *picoideus*. It is just possible that it actually is a wandering example of *picoideus*, but as it fits in so well as an extreme of our variable *harrisi* series, it seems advisable to call it *harrisi*. It would seem desirable to scrutinize closely any Vancouver Island record of *picoideus* based on a fall immature.

DOWNY WOODPECKER (*Dendrocopos pubescens*).—The subspecies of eastern Canada, from Nova Scotia to central Alberta, is *D. p. medianus* with a wing of 91–96.5 mm. in the male (Ridgway). From north Alberta, northward and westward, occurs another subspecies, *D. p. nelsoni*, distinguished by being larger (wing, male, 95–101.5) (Ridgway), having the white parts purer white, and with less barring in the tail. However it is sometimes said that *nelsoni* is of casual occurrence farther east, probably to northern New England. In the large series of *D. pubescens* in the Canadian National Museum there are specimens from New Brunswick (wing, 100; taken in June) that approach *nelsoni* in size, and several Ontario specimens that show a reduction in the tail barring. None of our material shows a combination of the two characters, but such could be expected, and specimens with this combination would be very similar to *nelsoni*. May not the basis for the statement that *nelsoni* is casual in the east, probably as far as New England, rest on such variants of *medianus*?

AMERICAN THREE-TOED WOODPECKER (*Picoides tridactylus*).—In Canada two races occur; an eastern form (*P. t. bacatus*) with little white in the back, represented in Canadian National Museum material by specimens from localities west to Manitoba; and a western form (*P. t. fasciatus*), with considerably more white in the back, represented in the collection by material from northern and western Alberta, Yukon, Alaska, and British Columbia. The material indicates that a regular cline does not exist; birds from Quebec to Manitoba are very similar (*bacatus*); Alberta birds are definitely different, with no overlap; there is still more white in the Alaska specimens (*fasciatus*).

However, the birds from southern British Columbia while referable to *fasciatus* on the basis of the amount of white in the back, have less white than northern Alberta birds, and approach the far-distant *bacatus* in appearance. They show what appears to be overlap through individual variation; thus two of thirteen specimens from southern British Columbia could be confused with three specimens of *bacatus* (one from Quebec and two from Manitoba).

The 1931 A. O. U. Check-List (p. 200) gives the range of *bacatus* as southern Mackenzie eastward, and casual in winter in southern British Columbia. Our two *bacatus*-like birds from southern British Columbia were taken in July, and were presumably part of the breeding population. They also correlate well as part of the picture of individual variation. On geographical probability, on season of occurrence, and on known variations of the local population, they are referable to *fasciatus* rather than to *bacatus* which they resemble.

EXAMPLES OF DISCONTINUOUS VARIATION

The examples listed above are of individuals more or less connected with their main population by intermediates. But in a number of other cases the individuals concerned differ sharply from the populations they have been assumed to represent. This is the type of variation called discontinuous by Mayr (1942: 72). Some examples follow.

STELLER'S JAY (*Cyanocitta stelleri*).—This species supplies a good demonstration of the fact that the presence or absence of a 'good' key character is not necessarily diagnostic. *C. s. stelleri*, without a white spot over the eye, is the form of the British Columbia coast; *C. s. annectens* of interior British Columbia was characterized by Ridgway (1904: 357) as differing by having a white spot above the eye, as well as some other characters. Later work has shown that the spot over the eye may be present or absent in interior British Columbian *annectens*. When present it is a good 'key' character for *annectens*, but specimens without it may also be *annectens* (Taverner, 1934: 305).

RED-TAILED HAWK (*Buteo jamaicensis*).—This is a confusing group taxonomically, with several color phases (*see* Taverner, 1936), but here only one example of the normal color phase will be mentioned.

From Alberta westward occurs the subspecies *B. j. calurus*, in which the normal phase is darker than eastern *B. j. borealis* that ranges from Nova Scotia to Alberta. *B. j. borealis*, according to Taverner (1936: 69), is the most constant form of the species, but even in the apparent centers of its range occasional *calurus*-like birds appear. Whether these are spontaneous variants, the results of occasional .previous

calurus matings, or stray wanderers from the west, is uncertain. Until eastern breeding of such individuals is demonstrated it seems prudent to place them in the latter category according to Taverner. But since Taverner wrote in 1936 the Canadian National Museum has received a bird, an adult in normal plumage, which was shot at its nest in Prince Edward Island, that differs from all others of the Museum specimens of eastern *borealis*, and is inseparable from western *calurus*. It differs from *borealis* in the rusty wash on breast, flanks and legs and in the distinct but incomplete barring on all rectrices, comparing better, in this respect, with British Columbia birds in normal plumage than with eastern birds.

It seems advisable to consider this specimen as an aberrant *borealis*, rather than to say that *B. j. calurus* breeds on Prince Edward Island.

YELLOW-BELLIED SAPSUCKER (*Sphyrapicus varius*).—The two races concerning us here are *S. v. varius*, which ranges from Nova Scotia to north British Columbia and (rarely) Yukon, and the very distinct *S. v. nuchalis*, which ranges in southern and central British Columbia and western Alberta. The latter is characterized in the male chiefly by the presence of a red nuchal bar; by the greater extent of the red throat patch; by less white in the back; and by less yellowish under parts. Rarely, in North Alberta and Ontario specimens of *varius*, a trace of red appears in the nuchal area. But from Quebec the National Museum of Canada has a male, taken May 31, that has a red nuchal bar and an extensively red throat patch. In these striking characters it resembles *nuchalis*. Though the red bar is smaller than in most males, it matches one male from Kamloops, B. C., and is about like most females of *nuchalis*. However, in the character of white in the back and of yellow in the under parts, it is closer to *varius*. If it were taken on the edge of the range of *nuchalis* it would be considered a hybrid closer to *nuchalis*. However from its geographical origin and date, it seems advisable to consider it as an unusual variant of *varius*.

DOWNY WOODPECKER (*Dendrocopos pubescens*).—*Dryobates pubescens gairdneri* of coastal British Columbia is distinguished from *D. p. leucurus* of the interior by the pronounced brownish tinge of the under parts. In a series of fifteen specimens from interior British Columbia from the general area of Penticton, in the Okanagan Valley, there is one specimen (Penticton, April 13, 1903) that falls completely outside the general range of variation of *leucurus* in having brownish-tinged under parts, thus resembling *gairdneri*.

Apparently a similar specimen was recorded from Vernon as *D. p. gairdneri* and accepted as such by Brooks and Swarth (1925: 65). It is quite possible that it is a variant of *leucurus*.

WHITE-CROWNED SPARROW (*Zonotrichia leucophrys*).—Two subspecies occur in Alberta: *Z. l. gambelii*, which ranges south in the mountains to Banff, and is characterized by its dark color and white lores; and *Z. l. oriantha*, which ranges north to the Cypress Hills and Waterton Lakes Park, and is characterized by its paler coloration and its black lores; east of Alberta, from Manitoba eastward, there is another black-lored bird, dark in general coloration, *Z. l. leucophrys*, and on the Pacific coast is a white-lored bird with an olive rather than red brown back, *Z. l. pugetensis*.

The color of the lores—black or white—makes a good key character. In the population of this species that lives along the Rocky Mountains from Waterton Lakes to Jasper there is a change in the percentage of each type as follows:

		Number of specimens	
	Locality	*Black lores*	*White lores*
gambelii	North of Jasper	0	all
	Jasper	1	16
oriantha	Banff	3	1
	Waterton Lakes	6	1

Now the single black-lored bird breeding (presumably) at Jasper is just as much a part of the *gambelii* population, with which it agrees in general color, as are the sixteen white-lored birds, and should be so identified. The white-lored bird from Waterton Lakes (presumably breeding) is as much a part of the *oriantha* population, with which it agrees in general color tone, as are the six black-lored birds, and should be so identified. It follows that occasional, isolated individuals of black-lored birds need not necessarily be either *oriantha* or *leucophrys*. There is a single specimen of a black-lored bird from Lac la Nonne taken on September 27 when many white-lored *gambelii* were migrating southward. It is too dark for *oriantha*, but is similar to *leucophrys*. It is possibly a variant of *gambelii* and I so consider it rather than record *Z. l. leucophrys* as straying to Alberta.

Another case, showing how variants may appear in this species, is of a Manitoba specimen, taken in September at Shoal Lake. It differs strikingly from both *leucophrys* and *gambelii* in having the color of the upper parts and flanks dull brown and olive, quite similar to *pugetensis* of the Pacific coast. However *pugetensis* has white lores, and this Manitoba specimen has dark lores. We can assume from geographical probability that the general color is due to a marked variation as striking as a black mark in the lores. Is it not just as reasonable to assume that the Lac la Nonne specimen with black lores is also a variant?

WANDERERS

In some instances the evidence has seemed to indicate that the specimens really were part of the populations they resembled. In the following two cases I have identified individuals as wanderers or migrants, because the evidence seems to indicate that that is probably the correct interpretation.

PALM WARBLER (*Dendroica palmarum*).—The Western Palm Warbler (*D. p. palmarum*) is smaller and paler than the eastern Yellow Palm Warbler (*D. p. hypochrysea*). The differences are so apparent that many field observers in eastern North America, where both occur in migration, identify them in life. The two forms intergrade in the Ottawa area. In the National Museum of Canada there is one specimen of the Western Palm Warbler, taken far out of its normal range on the north shore of the Gulf of St. Lawrence, near breeding time. This I consider a stray *D. p. palmarum*, because it falls so far out of the range of variation of *D. p. hypochrysea* in both size and color, and agrees so well with the western form, despite the unlikely date and locality (Rand: 1944).

BELTED KINGFISHER (*Megaceryle alcyon*).—The Eastern Belted Kingfisher, ranging from Nova Scotia to Yukon, is smaller than the western bird that inhabits British Columbia and the area to the southward.

Two specimens from southern British Columbia I have called *Megaceryle alcyon alcyon* rather than small *M. a. caurina* because: (1) they fall completely outside the range of variation of the Canadian National Museum series of *caurina;* (2) they fall within the lower part of the known range of variation of *alcyon;* and (3) they were taken in winter, when migrants from Yukon would be expected. If they had been taken in summer at the same place I probably would have referred them to *caurina*, and increased my allowance for the range of variation of that form.

DISCUSSION

Two quite different interpretations are possible when a specimen from a given area resembles a distant subspecies more than it does the one of normal local occurrence. It may be a wanderer, or it may be an extreme variant. Which explanation to accept must be decided on the basis of probability, treating each case individually.

Wanderers may appear almost anywhere, but some species are much more given to wandering than others. From our knowledge of the sedentary nature of Spruce Grouse, it is extremely improbable that far-wandering strays occur. With the Robin, strays would be much

more likely, and with Red Crossbills they would be expected. But this last is perhaps a special case in which whole populations move, and the evidence is based on quantitive data.

Variation is the normal thing in bird populations. As little as seventy-five per cent of a population may be identifiable to subspecies by morphological characters. Some of the remaining twenty-five per cent may be intermediates between it and the next subspecies, but some extreme variants may at least reach the average of some other subspecies. Some variants may be extreme, and there is a tendency for them to reduplicate some character already existing in another section of the species or in a related species.

The recognition, by most bird students, of the variability in populations seems to have lagged behind the recognition that individuals wander widely. Reported extensions of geographic range by casual occurrence are much more numerous in our current literature than are reports of the discovery of increased range of variation in a population, and it is not impossible that some phenomena reported as representing the first category actually belong to the second. Possibly there is an unconscious bias, due in part to the competitive making of local lists.

The wanderer has its place in our set of theories, as Grinnell (1922) has pointed out. The wanderers are the explorers and the colonizers. It is through them that species spread, and new areas are occupied. In these new areas, under new conditions, new races tend to evolve. That extensions of the ranges of species occur is one of the prerequisites for accepting the ably documented theory that most bird species have evolved in geographical isolation, and later spread to co-inhabit an area with their nearest relatives.

But while recorded range extensions have their place, so does evidence concerning normal and abnormal variation. Variation is the raw material that makes evolution possible. Through the action of selection on a local population under its peculiar conditions those characters most advantageous are retained, and thus subspecies may be built up.

One criticism of much current taxonomic work is that the range of variation—the overlap of subspecies through individual variation, and the proportion of unidentifiable specimens or specimens that have the characters of some other subspecies—is minimized. To make lists and categories and fit every specimen into a pigeonhole on the basis of its characters does not accord with the modern concept of subspecies. It is populations, with average characters, that we identify. From the viewpoint of a study of speciation, the minimizing of variation is disadvantageous, as it implies a static condition, and fails to recognize the actual dynamic variability that exists.

One must guard against examining a selected series, drawing up a diagnosis, and then identifying all subsequent individuals by this diagnosis, irrespective of other factors. Some conspicuous and convenient 'key character' such as the 'islanded spots' in the primaries of the Black Pigeon Hawk (*Falco columbarius suckleyi*) is occasionally likely to break down. This is equally true of such key characters as "wing 126 mm. or more" as given for *Dryobates villosus septentrionalis*.

If an additional specimen does not correspond with the diagnosis of the form usually occurring in the area, the diagnosis may well be reviewed to see if it accords with the characters of the subspecies. That is, the range of variation of a subspecies may prove to be greater than the definition has allowed.

Cases will occur in which a decision guided by probability is difficult, and error may be unavoidable.

Gross appearance, matching of many characters, and season of occurrence as well as geographical probability, are about the only guides to the probability of the specimens being wanderers.

In examining the probability that the specimens are variants, geographical probability, and the known range of variation of the subspecies and of related species, may be taken into account. If a conspicuous character is the one showing most divergence, other less conspicuous characters may not show it; and the season of occurrence may also be a guide.

Questions of course arise. Is there, if we knew all the facts, a criterion as to whether an individual belongs to a certain subspecies or not? It would seem that if an individual is part of a breeding population, and the population, on average characters, is definitely assignable to one subspecies, the individual should be considered as belonging to that subspecies irrespective of individual morphological characteristics. The fact that there are intermediate populations not assignable to any subspecies form a separate case.

There is then the difficulty of knowing whether or not an individual is actually part of a breeding population. Breeding specimens are, of course, ideal evidence. Usually a series from an area taken during the breeding season, with the evidence from examination of gonads, is the evidence that is used but, even in such cases probability may play a part. When specimens are taken in migration, it is necessary to infer their relationships. In identifying them it is necessary to go back and consult specimens assumed to be breeding, to obtain the range of variation throughout the subspecies, and not a selected series only.

The following question could arise. If an individual from the range

of one subspecies wandered and bred in the range of another, would it change its subspecific status? Its progeny would probably be absorbed in the population with which it bred and would become part of it, perhaps adding to its variability. It seems that the wandering individual, itself, would also change its status. Such a view is a corollary to the view that two subspecies cannot have a geographical or ecological range in common.

CONCLUSIONS

From a practical point of view, when individual specimens do not agree with the general series, the case should be examined with a view as to which is more probable, whether the specimen represents a stray or an individual variant. It is improbable that every case can be decided correctly. But in as much as identification as a wanderer may necessitate another heading in the faunal list, the addition of another form to the tally of those known from the area, and a range extension, it seems to me that the conservative view, other things being equal, is to consider doubtful cases as variants. It is not desirable to suppress the facts of their occurrence; under subspecies 'A' a line might follow stating that occasional individuals approaching (or similar to, or identical with) subspecies 'B' occur, as the data may require.

Some examples of this treatment for Canada are:

Turdus migratorius migratorius.—Common summer resident generally, from Nova Scotia to Yukon; a few winter in the south; occasional breeding specimens indistinguishable from *T. m. nigrideus* occur west to the Mackenzie Delta.

Picoides tridactylus fasciatus.—Resident from Yukon and western Mackenzie, southward through northern and western Alberta and British Columbia. The southern British Columbia population intergrades with eastern *bacatus* through individual variation.

Sphyrapicus varius varius.—Nova Scotia to northern British Columbia, southern Mackenzie, and rarely to southern Yukon; one Quebec variant is very similar to *S. v. nuchalis*.

In revisions, when listing material examined, it would be well to point out, that which shows the differences given and that which does not.

Despite the widely published caution that populations be assigned subspecific names only if specimens are available, it seems that at times the surer way of allocating the proper subspecific name to a population is to examine a revision, if one exists, and from it find if the area concerned has been definitely assigned to the range of one or

another subspecies on the basis of adequate data. If it has, subspecific allocation can be fairly sure, or if the area were one in doubt, or an area of intergradation, the population would need to be listed as "subspecies?" unless material were available for examination.

But here also a change is necessary in faunal treatments. The area of intergradation and overlap should be stated, as well as the range of the subspecies in typical form.

Suggested treatments are:

Zonotrichia leucophrys leucophrys.—Quebec to Ontario; in northern Manitoba, overlaps and intergrades with *Z. l. gambelii.*

Colaptes auratus luteus.—Nova Scotia and Quebec to Yukon; shows a cline throughout; increases in size to the north and west; overlaps and intergrades with *C. cafer* from southern Saskatchewan to southern British Columbia; occasional hybrid specimens as far east as Ontario.

REFERENCES CITED

ALDRICH, J. W.
1946. The United States races of the Bob-white. Auk, 63: 493–508.

ALLEN, G.
1914. Pattern development in mammals and birds. Amer. Nat., 48: 385–412, 467–484, 551–566.

AMERICAN ORNITHOLOGISTS' UNION
1931. Check-List of North American birds, 4th edition, 526 pp.

BROOKS, A., AND SWARTH, H. S.
1925. A distributional list of the birds of British Columbia. Pacific Coast Avifauna, No. 17, 158 pp.

CONOVER, B.
1944. The races of the Solitary Sandpiper. Auk, 61: 537–544.

GRINNELL, J.
1922. The role of the "accidental." Auk, 39: 373–380.

HARRISON, J. M.
1946. Exhibition of two varieties of the Robin *Erithacus rubecula* (Linn.). Bull. B. O. C., No. 66: 69.

HARRISON, J.
1944. The races of Mallard. Bull. B. O. C., No. 453: 58–60.

HØRRING, RICHARD, AND SALOMONSEN, F.
1941. Further records of rare or new Greenland birds. Med. om Grønland, 111, No. 5: 1–86.

MAYR, E.
1942. Systematics and the origin of species, 334 pp. (New York).

PHILLIPS, J. C.
1923. A natural history of the ducks, Vol. 2, 409 pp. (Boston and New York.)

RAND, A. L.
1944. Notes on the Palm Warbler, *Dendroica palmarum* (Gmelin) in Canada. Canadian Field-Naturalist, 58: 181, 182.

RIDGWAY, R.
1904. The birds of Middle and North America. Bull. U. S. Nat. Mus., No. 50, Pt. 3, 801 pp.

SWARTH, H.
1913. A study of a collection of geese of the *Branta canadensis* group from the San Joaquin Valley, California. Univ. Calif. Pub. Zool., 12: 1–22, 2 plates.
TAVERNER, P. A.
1942. Canadian races of the Great Horned Owls. Auk, 59: 234–245.
1934. Birds of Canada. Nat. Mus. Can., Bull. No. 72, 445 pp.
1936. Taxonomic comments on Red-tailed Hawks. Condor, 38: 66–71.
TUCKER, B. W.
1945. Purple-headed Starlings in the British Isles. Bull. B. O. C., No. 457: 36–38.
UTTAL, L. J.
1939. Subspecies of the Spruce Grouse. Auk, 56: 460–464.
WETMORE, A.
1931. Warm blooded vertebrates, part 1, Birds. Smith. Sci. Ser., 9, 166 pp.

Chicago Natural History Museum
Chicago
Illinois

THOMAS BARBOUR, 1884–1946

BY JAMES L. PETERS

Plate 12[1]

THOMAS BARBOUR was born on Martha's Vineyard, Massachusetts, August 19, 1884, eldest of the four sons of William and Julia Adelaide (Sprague) Barbour. His father, a director of the great linen mills of William Barbour and Son, located near Lisburn, Ireland, made frequent business trips to Europe, on which he was often accompanied by his family; hence Tom began his travels at an early age.

Private tutors and Browning's School in New York prepared him for college. During his boyhood he had many contacts with the outdoors but none so surely influenced and guided an instinctive bent for natural science as did his first visit to Florida in 1898. Following an attack of typhoid fever in that year he was sent to recuperate at his Grandmother Barbour's winter home at Eau Gallie, Florida. She, Sarah Elizabeth Barbour, was a most unusual character, a born naturalist, an excellent shot and an expert with a fly rod. She and her fourteen-year-old nephew fished in Lake Washington and travelled about southern Florida. It was she, also, at this time who took him to Nassau in the Bahamas for his first glimpse of the American tropics for which he then and there developed a lifelong absorbing interest.

Tom's mother had no outdoor interests whatsoever, but his father

[1] Photograph by Joseph Dixon.

Thomas Barbour

was fond of shooting and fishing, owned a share in the Tupper Lake Club in the Adirondack Mountains of northern New York State, and finally acquired the property, increased his holdings, and at the time of his death owned 45,000 acres. Here Tom and his three younger brothers passed many happy summers.

Tom was originally destined for Princeton, but then occurred one of those tricks of fate that must be regarded as the real turning point in his life. In the spring of 1899 a friend of his father's, who had tutored Tom after his attack of typhoid, took him to Commencement at Harvard. Tom spent an entire afternoon alone wandering about the Museum of Comparative Zoölogy, and fell in love with it on the spot. After that first visit he made up his mind that he was going to Harvard and not to Princeton.

He entered Harvard as a tall, gangling freshman in the autumn of 1902 and chose a room in Conant Hall which was the nearest dormitory to the Museum. During his undergraduate years, all the time that was not demanded by his attendance at classes was devoted to the Museum; perhaps it would be more correct to say that in what time he felt he could spare from his natural history pursuits he attended classes. Although he got off to a poor scholastic start in his freshman year, his marks during the remaining three years were mostly A's and B's, and he was graduated with the degree of A.B. in 1906.

In October of that same year he married Rosamond Pierce of Brookline, Massachusetts, and together they left on a honeymoon which took them to the East Indies. His family contacts enabled them to visit many places far off the beaten track—Darjeeling, India; a boat trip up the Irawaddy to Bhamo; Java, Bali, Lombok, Celebes, the Moluccas, New Guinea; thence to China and by steamer up the Siang River to Wuchow [now Tsangwu].

Every possible moment ashore while in the East Indies was devoted to collecting specimens representing nearly all branches of zoology, all of which found their way to Cambridge; several interesting new species were secured, and, what is more, were recognized by him in the field as probably new—a testimonial to the wealth of information that he had absorbed from Samuel Garman at the Museum of Comparative Zoölogy during his student days and from his extensive reading.

Then back to Harvard for his A.M. which he received in 1908. In that same year he went to Chile as a delegate to the First Pan-American Scientific Congress, held at Santiago, and, as might be expected, availed himself of every opportunity for collecting.

After taking his Ph.D. at Harvard in 1910, he represented the Association of American Universities at the reopening of the University of México in México City.

Likewise in 1910 he was appointed Curator of Reptiles and Amphibians in the Museum of Comparative Zoölogy and immediately set about building up the collection of those groups, but his interest in the Museum did not end with his own department. The next few years saw him sponsoring collecting trips as well as travelling extensively himself, chiefly to his beloved American tropics. He purchased several important ornithological collections for the Museum, notably the Swann collection of Accipitres.

His activities at the Museum were suspended during World War I while he was engaged in special intelligence work in Cuba, which required a knowledge of Spanish, but were immediately resumed when his services were no longer required by the U. S. Government.

On November 1, 1927, he became Director of the Museum, an ambition that he had cherished since that day in June, 1899, when, as a fifteen-year-old boy, he first wandered through its halls. He set about his new duties with his usual energy. In some ways the building seemed hopelessly archaic; with the exception of the library, most of the rooms (if they had any artificial illumination at all) were inadequately lighted with gas. There was a hand-hoist freight elevator, but the staff had to trudge up long flights of stairs to the collections; the exhibits were crowded, poorly displayed, and inadequately labelled. The public galleries were temporarily closed while the exhibits were rearranged, cleaned up and new labels prepared; the remainder of the building was wired for electricity and an electric passenger elevator replaced the antiquated hand-hoist with its splintery rope.

Other far-reaching changes that he inaugurated included an enlarged staff, with Harvard Corporation appointments in place of Museum appointments, and a closer tie-in with the University whereby some of the senior curators were given titles of 'Professor of Zoology' so that students could take research courses under those men and receive academic credit.

Tom's love for the American tropics has been frequently mentioned, but this does not convey any idea of the knowledge that he possessed of them. His greatest interests lay in Central America and the West Indies. In these lands bordering the Caribbean there was scarcely an island on which he had not set foot nor a country in which he had not travelled. Everything there appealed to him; he liked the people, the climate, the architecture, the scenery, the rich vegetation; the problems of geographic distribution and origin of faunas intrigued him. Spanish was a second tongue to him and his fluent use of that language opened doors that would be closed to the average foreigner and enabled him to make friends with people in all walks of life and gave him entrée to the out-of-the-way places, ordinarily so difficult of access.

This gift led directly to the last of the really great ornithological discoveries in neotropical America. While on one of his visits to Cuba, he had been into the northeastern corner of the Zapata Swamp and heard rumors about some strange birds to be found there. He therefore sent Fermin Cervera, who had accompanied him on previous visits to Cuba, on a series of trips into the region, with the result that *Ferminia cerverai*, *Torreornis inexpectata* and *Cyanolimnas cerverai* were first made known to science. Never one to let the grass grow under his feet, he described these new birds promptly—the wren in 1926 and the other two a few months later, in May, 1927. On the latter occasion Tom was ill in Philadelphia, but called me in Cambridge, and over the telephone we drew up the generic diagnoses and the plumage descriptions, and the paper appeared by the time he was back in Cambridge a few days later.

Another of Tom's achievements in which he took great pride was his part in the founding of the Barro Colorado Island Laboratory in the Canal Zone, and the fact that so many young men received their first thrilling glimpse of the tropics at Barro Colorado, that there Frank M. Chapman wrote 'My Tropical Air Castle,' and that some four hundred scientific papers were based on studies made there gave him a feeling of satisfaction that outweighed the pride of achievement.

Another project in which his influence was paramount and in which he took great pride was the Atkins Institution of the Arnold Arboretum at Soledád, near Cienfuegos, Cuba. This tropical botanical garden was the gift of Mr. and Mrs. Edwin F. Atkins of Boston and contained upwards of 220 acres. A biological laboratory was built in 1924 and a dormitory in 1933. Tom was named Custodian in 1927, and the high spot of his winter trips to the Caribbean was his annual visit to Soledád. Like the Barro Colorado Laboratory, the Garden was a spot where young teachers could gather some first-hand knowledge of the tropics and Harvard fellowships for study there are granted to graduate students.

It may not be generally realized that he was one of the prime movers in establishing the Brewster Memorial award.

The first impression gained by anyone meeting Thomas Barbour for the first time was his great size (he was nearly 6 feet 6 inches and in his prime weighed close to 300 pounds). The next impression was his colorful and forceful manner of speech, but the third and deepest impression of all was made by his prodigious memory. Everything he ever learned was stored away in it. He was an inveterate reader of all manner of books of travel, scientific works, history, biography and adventure. His reading was effortless since he had a photographic

eye that instantly transmitted an entire page to his brain, where the information was filed permanently. He was never at a loss for an answer, could give the dates of any voyage of exploration, the name of the ship and the names of the naturalists, and the facts concerning the discovery of many species of animals. He was familiar with a great number of animals, never forgot their names or appearance, their distribution or relationships. Thus, while primarily a herpetologist, he was really one of the last of that vanishing race, the all-round naturalist.

Although possessed of a wonderful gift for brilliant and entertaining conversation, Tom was strongly averse to formal speaking; perhaps he felt that it "cramped his style." It was only on rare occasions that he could be prevailed upon to appear on the platform and then only for a brief address. In discussion from the floor, however, he was in his element.

As long as his health and travelling conditions permitted, Tom always made a trip to Central America and the West Indies every winter, primarily to inspect Barro Colorado and Soledád, but opportunities to get into out-of-the-way places to do a little collecting were by no means neglected at such times. During the late 1920's and early '30's these trips were made with the late Allison Armour on his yacht the "*Utowana*." In addition to Panamá and Cuba, the *Utowana* at one time or another touched at points on the west coast of México, Honduras, islands off the south coast of Hispaniola and various islands in the Bahamas.

In 1934, accompanied by Mrs. Barbour and his two youngest daughters, he made a journey to Africa, down the west coast, a visit to Kruger Park, up the east coast by freighter, with many stops and side trips, and finally home *via* Palestine and Gibraltar. In 1935 he went to Africa again with his family, primarily to visit the wild-life reserves in South Africa.

Shortly after he became Director he began the habit of eating his luncheon in his back office; for companionship he invited some of the other members of the staff to bring their lunches also. Next an electric stove, refrigerator and sink were installed and Robert Gilbert, William Brewster's old colored retainer, who came to the Museum after Mr. Brewster's death, was brought in to prepare the meals and to clean up afterwards. Thus the famous "Eateria" came into existence and many roast ducks and venison or elk steaks, the result of Tom's shooting excursions, were served to the guests. Up to the time that Gilbert died, early in 1942, the "Eateria" had served nearly 21,000 guests, including many visiting scientists from foreign countries.

His bibliography numbers some 375 titles covering a large variety of subjects. As with most prolific scientific authors, it would be almost impossible to compile a complete list of his writings, except that he did so himself, first in a privately printed brochure covering his publications from 1901–1939 and a second similar list including everything from 1939–1944.

During his later years, when poor health curtailed his travels and activities, he found much pleasure in writing of his life and experiences. A series of essays in the 'Atlantic Monthly' was republished with additional chapters as 'A Naturalist at Large' (Little, Brown & Co., 1943) which was a 'best seller.' This was followed by 'That Vanishing Eden' (Little, Brown & Co., 1944), his personal account of Florida as he knew it from his first visit in 1898 to the present day, and which outsold 'A Naturalist at Large.' Then came 'A Naturalist in Cuba' (Little, Brown & Co., 1945) and lastly 'A Naturalist's Scrapbook' (Harvard University Press, 1946) which appeared posthumously.

His list of memberships and honors is truly impressive. In addition to his Harvard scholastic degrees, he was awarded honorary Sc.D.'s from the University of Havana in 1930, Dartmouth in 1936, Harvard in 1939 and Florida in 1944. He was Lecturer, and later Professor of Zoology at Harvard since 1922; member of the Faculty of the Peabody Museum (Harvard) since 1913; Trustee, Radcliffe College 1930–1934; Trustee, Carnegie Institution, 1935; member of the Advisory Board, Guggenheim Foundation; Member of the National Academy of Sciences, Fellow American Academy of Arts and Sciences, Washington Academy of Sciences. Fellow, American Ornithologists' Union; Charter Member, American Society of Mammalogists; Past President of the Society of Ichthyologists and Herpetologists; President of the New England Zoölogical Club; President of the Boston Society of Natural History, 1925–1927 and 1940–1946; Member of the Nuttall Ornithological Club, Academy of Natural Sciences of Philadelphia, Biological Society of Washington, American Society of Zoölogists, American Philosophical Society, American Antiquarian Society, Massachusetts Historical Society, Society of Tropical Medicine; Fellow of the New York Zoological Society; Honorary Member, Zoological Society of Philadelphia; Corresponding Member, Hispanic Society of America; Fellow, Royal Geographic Society, London; Fellow, Royal Asiatic Society (Straits Branch); Foreign Member, Zoological Society of London; Corresponding Member, Nederlandische Dierkundige Vereen, Amsterdam; Honorary Fellow, Academia de Ciencias Médicas Físicas y Naturales de la Habana; Society for the Preservation of the Fauna of the British Empire; Linnaean Society of London; and Phi Beta Kappa and Sigma Xi fraternities.

His clubs included Somerset, Tavern and Harvard Clubs of Boston, Harvard Club of New York, Cosmos Club of Washington, Explorers and Boone and Crocket Clubs.

On January 8, 1946, he passed quietly away following a cerebral hemorrhage suffered two or three days previously. In his death the American Ornithologists' Union has lost a Fellow who was one of the world's most distinguished zoologists.

Museum of Comparative Zoölogy
Cambridge
Massachusetts.

TWENTY-THIRD SUPPLEMENT TO THE AMERICAN ORNITHOLOGISTS' UNION CHECK-LIST OF NORTH AMERICAN BIRDS[1]

In the course of preparation of the manuscript for the Fifth Edition of the A. O. U. Check-List, the Committee on Classification and Nomenclature has under continuous study proposals that involve addition or elimination of forms, and other suggested changes. The present supplement, covering cases to the end of 1947, as far as they have come to attention and have been decided, is published in accordance with instructions from the Council of the Union.

As work on the manuscript for the Fifth Edition has progressed it has been necessary to rewrite practically all the ranges, because of the considerable amount of new material now available. While this requires much more time, and imposes a a far heavier task on the Committee than any of the members contemplated, it has been considered necessary to do this in order to produce a volume that will be of value.

Committee: Alexander Wetmore, Chairman; Herbert Friedmann; Frederick C. Lincoln; Alden H. Miller; James L. Peters; Adriaan J. van Rossem; Josselyn Van Tyne; John T. Zimmer

Page

40. ***Anser fabalis sibiricus*** (Alpheraky). Middendorff's Bean Goose. [171.1a] *Melanonyx arvensis sibiricus* Alpheraky, Geese Europe and Asia, 1905, p. 104, pls. 10, 23. (East Siberia.) Additional form. Eastern Siberia; in

[1] The Twenty-second Supplement was published in 'The Auk,' vol. 64, no. 3, July, 1947, pp. 445–452.

winter to China and Japan. Accidental on St. Paul Island, Pribilof Islands, Alaska. See Gabrielson, Auk, vol. 64, 1947, p. 325.

42. *Dendrocygna autumnalis autumnalis* becomes *Dendrocygna autumnalis fulgens* Friedmann, Condor, vol. 49, no. 5, September 12, 1947, p. 190. (Lomita Ranch, Texas.)

51. *Aythya marila marila* (Linnaeus). EURASIAN SCAUP DUCK. [148a.] *Anas Marila* Linnaeus, Fauna Suecica, ed. 2, 1761, p. 39. (Lapland.) Additional subspecies. Iceland and the Scandinavian Peninsula to Siberia; south in winter to southern Europe and India. Casual in Greenland (Nanortalik, Danmark's Havn, Angmagssalik, Hochstetter Vorland). See Hørring and Salomonsen, Medd. om Grønland, Bd. 131, no. 5, 1941, p. 12.

52. *Glaucionetta* Stejneger, 1885, becomes *Bucephala* Baird, 1858, as the latter is not preoccupied by *Bucephalus* of earlier authors.

Bucephala Baird, Rep. Expl. Surv. R. R. Pac., vol. 9, 1858, pp. XXIII, L, 787, 795. Type, by original designation, *Anas albeola* Linnaeus.

The forms will stand as follows:

Bucephala clangula clangula (Linnaeus).
Bucephala clangula americana (Bonaparte).
Bucephala islandica (Gmelin).
Bucephala albeola (Linnaeus).

58. *Oidemia nigra nigra* (Linnaeus). EUROPEAN BLACK SCOTER. [163a.] *Anas nigra* Linnaeus, Syst. Nat., ed. 10, vol. 1, 1758, p. 123. (Lapland and England.) Additional subspecies. Iceland and Norway to the Taimyr Peninsula, south to western and southern Europe. Accidental in Greenland (Nanortalik Øen). See Schiøler, Danmarks Fugle, vol. 2, 1926, p. 134.

59. The subfamily name *Erismaturinae* becomes *Oxyurinae* through replacement of *Erismatura* by *Oxyura*. See Supplement Twenty-two, Auk, 64, 1947, p. 446.

69. *Buteo lagopus pallidus* (Menzbier), added in Supplement Twenty, Auk, vol. 62, 1945, p. 439, becomes *Buteo lagopus kamtchatkensis* Dementiev, Orn. Monatsb., vol. 39, no. 2, March 4, 1931, p. 54 (Mouth of the Kikhchik River, Kamchatka), because of the prior *Buteo pallidus* Lesson, Traité d'Orn., livr. 2, May, 1830, p. 82, for another species.

71. *Haliaeetus leucocephalus washingtoniensis* (Audubon) of Supplement Nineteen, Auk, 61, 1944, p. 445, becomes *Haliaeetus leucocephalus washingtonii* (Audubon). The name is taken from Birds Amer., fol. ed., 1827, pl. 11, the plate in different copies being lettered with one or the other of the two subspecific names given above, thus leading to confusion. It appears that Bangs, Auk, vol. 15, 1898, pp. 174–176, separated the bird of northeastern North America as *H. l. washingtoni*, and as the first reviser fixed the name to be used, which, however, is to be spelled as given above from Audubon to agree with the original form.

75. *Falco fusco-coerulescens septentrionalis* Todd becomes *Falco femoralis septentrionalis*, since *Falco fusco-coerulescens* Vieillot, 1817, based on Azara's (*Alconcillo*) *del obscuro azulejo*, refers to *Falco albigularis* Daudin, 1800. The next name available is *Falco femoralis* Temminck, Nouv. Rec. Planches Col. Ois., livr. 21, vol. 1, April, 1822, pl. 121. (Brazil.) See Peters, in Peters and Griswold, Bull. Mus. Comp. Zoöl., vol. 92, April, 1943, p. 294.

76. *Falco columbarius richardsoni* becomes *Falco columbarius richardsonii* to conform with original spelling.

80. *Canachites franklini* becomes *Canachites franklinii* to conform with original spelling.

81. *Bonasa umbellus thayeri* is dropped as not separable from *Bonasa umbellus togata*. See Aldrich and Friedmann, Condor, vol. 45, 1943, pp. 96–97.

83. *Lagopus mutus reinhardi* is dropped as not separable from *Lagopus mutus rupestris*. See Friedmann, U. S. Nat. Mus. Bull. 50, pt. 10, 1946, pp. 123–126.

84. *Lagopus mutus kelloggae* is dropped as not separable from *Lagopus mutus nelsoni*. See Friedmann, U. S. Nat. Mus. Bull. 50, pt. 10, 1946, pp. 118–120.

91. *Phasianus colchicus torquatus* becomes *Phasianus colchicus* Linnaeus, Syst. Nat., ed. 10, vol. 1, 1758, p. 158 (Rion), in so far as the area of the A. O. U. Check-List is concerned, since the pheasants of this species now established in our limits represent a mixture of two or more subspecies. See Delacour, in The Ring-necked Pheasant and its Management in North America (edited by W. L. McAtee), 1945, p. 8.

95. *Rallus longirostris magdalenae* van Rossem. MAGDALENA CLAPPER RAIL. [211e.] *Rallus longirostris magdalenae* van Rossem, Proc. Biol. Soc. Washington, vol. 60, May 19, 1947, p. 51. (Almejas Bay, Santa Margarita Island, Magdalena Bay, Baja California.) Additional subspecies. Pacific coast of Baja California, breeding from Scammon Lagoon (probably from San Quintín Bay) south to Magdalena Bay; in fall south to Todos Santos.

101. *Jacana spinosa gymnostoma* becomes *Jacana spinosa spinosa* (Linnaeus). *Fulica spinosa* Linnaeus, Syst. Nat., ed. 10, vol. 1, 1758, p. 152. (South America, ex Edwards, Nat. Hist. Birds, p. 48, pl. 48 = Panamá, designated by Todd, Ann. Carnegie Mus., vol. 10, 1916, p. 219.) See Brodkorb, Misc. Publ. Mus. Zool. Univ. Michigan, no. 55, January 30, 1943, p. 36.

101. *Haematopus ostralegus ostralegus*, in so far as North American records are concerned, becomes *Haematopus ostralegus occidentalis* Neumann, Die Gefiederte Welt, vol. 58, pt. 14, 1929, p. 161. (Auskerry, Orkney, designated by Neumann, Anz. Orn. Ges. Bayern, vol. 2, no. 4, April. 1932, pp. 147–148.) See Witherby, Ibis, 1932, p. 99; and Salomonsen, Ibis, 1930, p. 65, where two specimens are listed from Greenland (under the name *Haematopus ostralegus malacophaga*, which is considered a synonym of *occidentalis*).

111. *Lymnocryptes minima* again becomes *Lymnocryptes minimus*, since it is now determined that the generic name is of masculine gender.

112. *Numenius phaeopus islandicus* Brehm. ICELAND WHIMBREL. [267b.] *Numenius islandicus* Brehm, Handb. Naturg. Vög. Deutschl., 1831, p. 610. (Iceland.) Additional form. Iceland and Faeroes. Of irregular occurrence in southern Greenland (many records). See Hørring and Salomonsen, Medd. om Grønland, Bd. 131, no. 5, 1941, pp. 30–33.

142. *Chlidonias nigra surinamensis* becomes *Chlidonias niger surinamensis* since the generic name *Chlidonias* (*lapsus calami* for *Chelidonias*) is of masculine gender. See Witherby, Jourdain, Ticehurst and Tucker, Handb. Brit. Birds, vol. 5, 1941, pp. 2, 6.

142. *Chlidonias leucoptera* becomes *Chlidonias leucopterus*, since the generic name *Chlidonias* is of masculine gender (see above under *Chlidonias niger surinamensis*).

150. *Fratercula arctica grabae* (Brehm). SOUTHERN PUFFIN. [13b.] *Mormon Grabae* C. L. Brehm, Handb. Naturg. Vögel Deutschl., 1831, p. 999. (Faeroes and other neighboring islands.) Additional form. Faeroes, south-

ern Norway and western Sweden, south to the Channel Islands and Brittany; a bird banded on St. Kilda Island, Scotland, recovered in Newfoundland. See Leach, Brit. Birds, vol. 33, 1940, p. 281.

155. *Zenaida asiatica clara* van Rossem. SAN LUCAS WHITE-WINGED DOVE. [319b.] *Zenaida asiatica clara* van Rossem, Proc. Biol. Soc. Washington, vol. 60, May 19, 1947, p. 52. (Agua Caliente, 800 feet altitude, Baja California.) Additional form. Resident in the Cape Region of Baja California.

177–178. *Micropus* Meyer and Wolf, 1810, becomes *Apus* Scopoli, 1777, p. 483, since the latter is not preoccupied by *Apos* Scopoli, 1777, p. 404, for a genus of Crustacea. See Wetmore, Wils. Bull., vol. 59, 1947, p. 211.

Apus Scopoli, Intr. Hist. Nat., 1777, p. 483. Type, by tautonymy, *Hirundo apus* (Linnaeus). The classification, and form affected, will stand as follows:

Order APODIFORMES
Suborder APODI
Family APODIDAE
Subfamily APODINAE
Apus pacificus pacificus (Latham).

183. *Amazilia violiceps ellioti* Berlepsch. NORTHERN VIOLET-CROWNED HUMMINGBIRD. [439.2.] *Uranomitra ellioti* Berlepsch, Proc. U. S. Nat. Mus., vol. 11, September 25, 1889, p. 561. (Mazatlán, Sinaloa.) Additional form. Sonora to Michoacán; recorded from Palmerlee, Cochise County (as *Amazilia salvini*), and Paradise, Chiricahua Mountains, Arizona. See Wetmore, Journ. Washington Acad. Sci., vol. 37, March 15, 1947, pp. 103–104.

188. *Colaptes cafer martirensis* is dropped as not separable from *Colaptes cafer collaris*. See van Rossem, Proc. Biol. Soc. Washington, vol. 60, May 19, 1947, pp. 53–54.

196. *Dendrocopos villosus scrippsae* is dropped as not separable from *Dendrocopos villosus hyloscopus*. See Todd, Ann. Carnegie Mus., vol. 30, December 16, 1946, p. 312.

224. *Aphelocoma coerulescens woodhousei* becomes *Aphelocoma coerulescens woodhouseii* to conform with original spelling.

235. *Parus wollweberi annexus* (Cassin) becomes a synonym of *Parus wollweberi wollweberi*. The form of the Check-List is named *Parus wollweberi phillipsi* van Rossem, Fieldiana, Zool., vol. 31, no. 10, February 28, 1947, p. 89. (Yank Spring, Sycamore Canyon, Pajaritos Mountains, Santa Cruz County, Arizona.)

246. *Thryomanes bewickii magdalensis* Huey. MAGDALENA BEWICK'S WREN. [719n.] *Thryomanes bewickii magdalensis* Huey, Trans. San Diego Soc. Nat. Hist., vol. 9, no. 35, October 1, 1942, p. 430. (Santo Domingo, Magdalena Plain, lat. 25° 30′ N., Baja California.) Additional form. Coastal plain around Magdalena Bay from lat. 26° N. south to lat. 24° N.

248. *Telmatodytes palustris laingi* Harper becomes *Telmatodytes palustris iliacus* Ridgway, since Ridgway's type of *iliacus*, taken at Wheatland, Indiana, April 30, 1883, proves to be a migrant of the form described by Harper as *laingi*. See Aldrich, Proc. Biol. Soc. Washington, vol. 59, October 25, 1946, p. 131.

248. *Telmatodytes palustris iliacus*, as recognized in the Twentieth Supplement, Auk, vol. 62, July, 1945, p. 446, becomes again *Telmatodytes palustris dissæptus* (Bangs), as shown in the Check-List, ed. 4, 1931, p. 248. See Aldrich, Proc. Biol. Soc. Washington, vol. 59, October 25, 1946, p. 131.

250. *Catherpes mexicanus griseus* Aldrich. NORTHERN CAÑON WREN. [717c.] *Catherpes mexicanus griseus* Aldrich, Proc. Biol. Soc. Washington, vol. 59, October 25, 1946, p. 131. (Logy Creek, Yakima Indian Reservation, Yakima County, Washington.) Additional form. Resident in eastern Washington and eastern Oregon.

250. *Catherpes mexicanus punctulatus* Ridgway, removed in Supplement Nineteen, Auk, vol. 61, 1944, p. 456, restored again to the Check-List. See Aldrich, Proc. Biol. Soc. Washington, vol. 59, October 25, 1946, pp. 131–132.

264. *Phylloscopus trochilus acredula* (Linnaeus). NORTHERN WILLOW WARBLER. [747.2.] *Motacilla Acredula* Linnaeus, Syst. Nat., ed., 10, vol. 1, 1758, p. 189. [Habitat in Europa = Sweden.) Additional form. Northern Europe and western Siberia to eastern and southern Africa. Accidental at Myggbukta, northeast Greenland, 18 September, 1937. See Bird and Bird, Ibis, 1941, p. 129.

266. *Regulus satrapa amoenus* van Rossem. SIERRA GOLDEN-CROWNED KINGLET. [748c.] *Regulus satrapa amoenus* van Rossem, Condor, vol. 47, no. 2, April 6, 1945, p. 77. (Lake Audrain, Eldorado County, California.) Additional form. Interior of British Columbia to Sierra Nevada, California and New Mexico; in winter to the highlands of México.

273. *Sturnus vulgaris zetlandicus* Hartert. SHETLAND STARLING. [493a.] *Sturnus vulgaris zetlandicus* Hartert, Nov. Zool., vol. 25, November, 1918, p. 329. (North Yell, Shetland Islands.) Additional form. Shetland Islands (except Fair Island), and Outer Hebrides. Accidental at Myggbukta, northeast Greenland. See Bird and Bird, Ibis, 1941, p. 125.

295. *Oporornis tolmiei monticola* Phillips. SOUTHERN MACGILLIVRAY'S WARBLER. [680a.] *Oporornis tolmiei monticola* Phillips, Auk, vol. 64, no. 2, April, 1947, p. 297. (Hart Prairie, San Francisco Mountain, Arizona.) Additional form. Southeastern Oregon and southwestern Wyoming to central Arizona and New Mexico.

296. *Geothlypis trichas campicola* Behle and Aldrich. NORTHERN PLAINS YELLOWTHROAT. (681k.] *Geothlypis trichas campicola* Behle and Aldrich, Proc. Biol. Soc. Washington, vol. 60, July 2, 1947, p. 69. (Yellowstone River, 5 miles west of Forsyth, 2750 feet elevation, Rosebud County, Montana.) Additional form. East of the Cascade Mountains from British Columbia, Washington and Oregon east to Saskatchewan, northern Wyoming and northern North Dakota.

296. *Geothlypis trichas arizela* Oberholser. PACIFIC YELLOW-THROAT. [681c.] *Geothlypis trichas arizela* Oberholser, Auk, vol. 16, no. 3, July, 1899, p. 257. (Fort Steilacoom, Washington.) Additional form. Pacific coast region from western British Columbia south, west of the Cascades, to northwestern California. See Gabrielson and Jewett, Birds of Oregon, 1940, pp. 511–512; Behle and Aldrich, Proc. Biol. Soc. Washington, vol. 60, July 2, 1947, pp 71–72.

309. *Quiscalus versicolor* Vieillot, the BRONZED GRACKLE, again listed as *Quiscalus quiscula versicolor*.

313. *Richmondena cardinalis seftoni* Huey. SANTA GERTRUDIS CARDINAL. [593f.] *Richmondena cardinalis seftoni* Huey, Trans. San Diego Soc. Nat. Hist., vol. 9, no. 21, July 31, 1940, p. 216. (Santa Gertrudis Mission, Baja California.) Additional form. Northeastern Vizcaíno Desert, central Baja California.

332. *Pipilo fuscus petulans* becomes *Pipilo fuscus wrangeli* (Bonaparte), from *Oriturus wrangeli* "Brandt" Bonaparte, Consp. Gen. Avium, vol. 1, pt. 2, 1850, p. 470. (As. s. maxime or. = probably San Francisco, California.) See van Rossem, Auk, vol. 59, 1942, pp. 449–450; Condor, 47, 1945, pp. 268–269.

336. *Passerculus sandwichensis magdalenae* van Rossem. MAGDALENA SAVANNAH SPARROW. [542h.] *Passerculus sandwichensis magdalenae* van Rossem, Condor, vol. 49, no. 3, May 31, 1947, p. 102. (North Estero, Magdalena Bay, Baja California.) Additional form. Tidal marshes of Magdalena Bay, Baja California; in winter south to the Cape Region.

336. *Passerculus sandwichensis atratus* van Rossem. SONORA SAVANNAH SPARROW. [542i.] *Passerculus sandwichensis atratus* van Rossem, Trans. San Diego Soc. Nat. Hist., vol. 6, no. 14, November 28, 1930, p. 218. (Tóbari Bay, Sonora.) Additional form. Tidal marshes of central and southern Sonora; in winter to the Cape Region of Baja California (Todos Santos). See van Rossem, Condor, 49, 1947, pp. 105–106.

342. *Aimophila ruficeps sanctorum* van Rossem. TODOS SANTOS RUFOUS-CROWNED SPARROW. [580h.] *Aimophila ruficeps sanctorum* van Rossem, Proc. Biol. Soc. Washington, vol. 60, May 19, 1947, p. 55. (Todos Santos Islands, off Ensenada, Baja California.) Additional form. Todos Santos Islands, northwestern Baja California.

342. *Aimophila ruficeps lambi* becomes a synonym of *Aimophila ruficeps canescens* Todd. See van Rossem, Proc. Biol. Soc. Washington, vol. 60, May 19, 1947, pp. 54–55.

353. *Passerella iliaca hyperborea* Bonaparte of the Twentieth Supplement, Auk, 62, 1945, p. 449, again becomes *Passerella iliaca insularis* Ridgway. See Hellmayr, Cat. Birds Amer., Field Mus. Nat. Hist., Zool., vol. 13, pt. 11, 1938, p. 588.

GENERAL NOTES

A new race of bearded bulbul from the Belgian Congo.—When Count Nils Gyldenstolpe (Bull. Brit. Orn. Club, 43: 131, 1923) described *Trichophorus swainsoni bannermani* from Lesse in the Semliki Valley, he believed that another very similar species with thicker bill, *T. calurus* Cassin, lived in the same area. Subsequent field studies have shown this not to be the case. Most Semliki Valley specimens are strikingly slender-billed; and so—Mr. Hermann Grote kindly informs me—is the type of *Criniger verreauxi ndussumensis* Reichenow, still preserved in the Berlin Museum. The type locality of *ndussumensis* is Kinyawanga, close to the present post of Beni, and within 40 kilometers of Lesse. It was a camp of Dr. F. Stuhlmann, but not situated in the Ndussuma area near Irumu, as Reichenow thought.

The name *bannermani* is thus synonymous with *ndussumensis* Reichenow (Die Vögel Afrikas, 3: 383, 1904), and the thicker-billed birds with rather greenish tails which occupy most of the Upper Congo Forest and many wooded areas in Uganda are in need of a new name. They have long been confused with *ndussumensis*.

Since Emin Pasha is known to have collcted such a bird at Bellima in the Uelle District before 1888, I propose to name the race as follows:

Criniger calurus emini, new subspecies

TYPE: Adult male, Amer. Mus. Nat. Hist. no. 296914, Lukolela, middle Congo River, August 16, 1930.

DIAGNOSIS: In color and size *emini* is similar to nominate *calurus* of the Lower Congo, Gaboon, and Cameroon, save that tail and upper tail-coverts are less rufous, more washed with green. It differs in much the same way from *C. c. ndussumensis*, and also by its thicker bill.

MEASUREMENTS OF THE TYPE: Wing, 95 mm.; tail, 87; culmen to base, 21; tarsus, 20. Some specimens of *emini* from the Ituri have the tail a little more rufous than those of Uganda or of the region near Lukolela, although their bills are not so slender as in *ndussumensis*.

RANGE: From the middle Congo River and Luebo in the Kasai District eastward and northeastward to the Manyema, Ituri, and Uelle districts of the eastern Congo, and to forest patches in Uganda, from Bugoma and Budongo to the base of Mount Elgon.

The range of the slender-billed *ndussumensis* is much more restricted, and includes the forested lowlands in and near the Semliki Valley and on the eastern side of the Rutshuru Valley. In the latter area, Dr. Moriz Sassi writes me, Rudolf Grauer collected two females with small bills for the Vienna Museum. Intergradation between *ndussumensis* and *emini* is evident in specimens taken 46 kilometers south of Irumu and at Angumu, 190 kilometers west of Lake Edward. Moreover, the pronounced variation in thickness of bill at Angumu is paralleled by similar variation among specimens of *C. c. calurus* from forested lowlands in southern Cameroon. An acquaintance of thirty-eight years with this common white-bearded bulbul, its behavior, and its voice, convinces me that neither the shape of the bill nor the color of the tail is a specific character.—JAMES P. CHAPIN, *American Museum of Natural History, New York, N. Y.*

A new stone sparrow from Persia.—It might be useful to have the description of this new sparrow available before the final reports of my 1940 Iran collections can be published. I therefore describe it as:

Gymnoris xanthocollis occidentalis, new subspecies

TYPE: Adult male; Abulhassan, near Sar i Dasht in Bakhtiari, western Persia; April 28, 1940; W. Koelz, collector. (Type on deposit in American Museum of Natural History, New York, N. Y.)

DIAGNOSIS: Similar to *G. x. xanthocollis* from India, and *G. x. transfuga* from Sind and Baluchistan, but paler than either, and with a slightly more slender bill.

MEASUREMENTS OF THE TYPE: Wing, 86.0 mm.; tail, 54.0; length of the bill from the skull, 14.0; width of the bill at the level of the nostrils, 5.5.

RANGE: Western Persia, from Fars westward into Bakhtiari and Khuzistan. The birds that breed in the neighboring plain of Mesopotamia will probably be found to belong to this new race.

REMARKS: The new race represents the end of a westward trend in a general reduction of pigmentation. In *occidentalis* the whole of the upper parts are sandy and the lesser wing-coverts are the color of rust. The eastern populations of India (*xanthocollis*) are much darker, light earth brown above and with chestnut lesser wing-coverts. The coloration of the intervening populations of Baluchistan and Sind (*transfuga*) is exactly intermediate.

The thickness of the bill is the same in *xanthocollis* and *transfuga;* in *occidentalis* the bill is a little more slender. The difference, at the level of the nostrils, amounts to only five per cent of the total length of the bill, but this difference, though small, is appreciable to the eye.—WALTER KOELZ, c/o *American Consul, Bombay, India.*

The status of *Synallaxis sclateri* Cabanis.—After receiving from Dr. A. Döring an "authentic specimen" of *Synallaxis sclateri*, collected near Córdova, Argentine Rep., Sclater declared this name to be a synonym of his *Synallaxis hudsoni*, which he had described in 1874 (*see* Sclater, P. Z. S. London, 1879: 461; and Cat. Birds Brit. Mus., 15: 70). Hellmayr (Cat. Birds Americas, 4: 150, 1925) accepted this view without examining the type of *Synallaxis sclateri*, described by Cabanis in 1878 (Jour. f. Orn., 26: 96) and kept in the Berlin Museum (No. B. 15006). Its original label reads: "*Synallaxis sclateri* Doer. N. 5 ♂ Sierra de Cordova. Selten."

Comparison with *hudsoni* undertaken by the writer at once showed *sclateri* to be quite another species; the former differs by its pale yellowish instead of cinnamon gular spot, spiny tail feathers with pale and rigid shafts, pipit-like juvenal plumage and many other points.

The nearest relatives of *sclateri* are *S. anthoides* King (Chile and southern Argentina) and *S. humilis* Cabanis (Perú and western Bolivia). In fact, *sclateri* in some way bridges the wide gap separating the two other species. All three seem to depend on rocky country (whereas *hudsoni* lives in the pampas). Yet they have so many distinctive characters of their own that they all should be kept as separate species. All three have been removed by Hellmayr (1925) from *Synallaxis* and included in the genus *Asthenes*.

Regarding the markings of the upper side, *sclateri* stands between *anthoides* and *humilis;* the contrast between the dark centers of the feathers and their paler margins, is far less pronounced in *sclateri* than in *anthoides*, but not nearly as obsolete as in *humilis*. The central rectrices of *sclateri*, dark brownish throughout, are devoid of the pale margins so conspicuous in *anthoides*, and in this respect approach *humilis*. The rusty pattern of the four outer rectrices is of almost the same extent in *sclateri* and *anthoides*, but of a much darker shade in the former; in *humilis* it is as dark as in *sclateri*, but considerably reduced in scope. The tail feathers are acuminate in *anthoides*, less so in *humilis* and bluntest in *sclateri*. Below, *sclateri* resembles

anthoides, both in adult and juvenal plumage, but *sclateri* is of a considerably darker shade, this being most apparent in the juvenal plumage which in *sclateri* has a mottled throat and in *anthoides* a white, unspotted one. *Humilis* differs from both by having, in the adult plumage, a strongly mottled throat instead of a plain one. The wing pattern is different in all three species. The rusty speculum formed by the color of the primaries is largest in *sclateri*, smallest and darkest in *humilis*. The coverts of the secondaries have a blackish center with sharply contrasting pale margins in *anthoides*, while they are almost uniformly colored in *humilis*. This difference is linked by *sclateri*.

All three species are of almost the same size, but *sclateri* seems to have by far the longest tail. Measurements are:

S. anthoides	♂ ad.	wing	76 mm.	tail	73 mm.
	♂ juv.	wing	69 mm.	tail	66 mm.
S. sclateri	♂ ad.	wing	76 mm.	tail	in molt
	juv.	wing	75.5 mm.	tail	90 mm.
S. humilis	ad.	wing	74 mm.	tail	70 mm.
	ad.	wing	73 mm.	tail	61 mm.

Asthenes sclateri seems to be restricted to the Sierra de Córdova, where it has been found by Dr. Döring to live only among rocks. It is, as emphasized by its discoverer, "a true mountain species." The two Berlin specimens (the type and a bird in juvenal plumage, sent in 1882 from the Sierra de Córdova by the well-known naturalist Fritz Schulz, No. 27155) are apparently the only ones so far collected.

MATERIAL EXAMINED.—*A. anthoides:* ARGENTINA: Chubut, 1 ♂ ad.; Bariloche (Gob. Río Negro), 1 ♂ juv. *A. sclateri:* ARGENTINA: Sierra de Córdoba, 1 ♂ ad. (type), 1 juv. *A. humilis humilis:* PERÚ: Maraynioc (Dept. Junín), 2 ♂♂ ad. (cotypes). *A. hudsoni:* ARGENTINA: Buenos Aires, 1 ad., 1 juv.—ERWIN STRESEMANN, *Zoological Museum, Berlin, Germany.*

A new name for *Xiphorhynchus spixii similis* Zimmer.—Mr. James L. Peters and Mr. W. E. C. Todd have both kindly called my attention to the fact that in describing this form from Buena Vista, Colombia, I obviously overlooked the earlier *Dendroplex similis* Pelzeln, a synonym of *Xiphorhynchus obsoletus obsoletus* (Lichtenstein). In view of the decided priority of Pelzeln's usage, I propose to rename the north-east Colombian bird as follows:

Xiphorhynchus spixii buena-vistae, new name for *Xiphorhynchus spixii similis* Zimmer (not *Dendroplex similis* Pelzeln, Orn. Bras., 1: 46, 1868), Amer. Mus. Novitates, no. 756: 9, Nov. 30, 1934.

My thanks are due to Mr. Peters and Mr. Todd for advising me of my blunder.—JOHN T. ZIMMER, *American Museum of Natural History, New York, N. Y.*

Eastern Goldfinch feeding on June berry.—There are only a few scattered records in ornithological literature of fruit-eating by the Eastern Goldfinch (*Spinus tristis tristis*). On July 2, 1947, the writer and Ernest Limes, Jr. spent several hours in the Oak Openings, Lucas County, Ohio, observing the birds that came to feed in a very large June berry tree (*Amelanchier laevis*) heavily laden with fully ripened fruit. One of the most common visitants to this tree was the Eastern Goldfinch. As we observed these birds, of which there were never less than eight or ten in the tree at one time, it was clearly determined with the aid of binoculars that they were feeding on the fruits, pulling them off and crushing them in their beaks, then evidently consuming both seeds and pulp. Other birds which fed on the fruits during our observa-

tion were Cedar Waxwings, Robins, Brown Thrashers, Catbirds, Baltimore Orioles, and a single Rose-breasted Grosbeak.—FLOYD B. CHAPMAN, *Division of Conservation, Columbus, Ohio.*

Cowbird behavior.—The usual pattern of behavior of the Cowbird in parasitizing the nests of other species, as described by Hanna (Wilson Bull., 53: 229–231, 1941), is occasionally varied, as the author points out. A case of such variation seems worth recording. On June 3, 1947, while at work near my lakeside cottage, I became aware that a female Cowbird had settled on a Yellow Warbler's nest, in process of building, two feet up in a small spirea and just twenty feet from where I sat. My immediate reaction—fatal, perhaps, to a more revealing observation—was to start protectively toward the nest whose construction I had been watching. Of course the Cowbird flew. On examination I found that the interloper had not dropped its egg—possibly, I considered, because the nest, as yet unlined, was too flimsy. However, next morning, there was a Cowbird's egg in the nest, embedded so deeply by its own weight as not to interfere with the placing of the lining. I removed it and, on the following day, the lining had been added, the nest was firm and the Yellow Warbler had laid an egg. Two days later the nest was empty. This observation gave me to reflect that perhaps some two-story nests are not so in fact but rather those in which the egg has become embedded in similar circumstances.—E. R. FORD, *Newaygo, Michigan.*

Long-eared Owls and red foxes.—While I was following a red fox (*Vulpes regalis*) trail in the snow on the Moingona Area south of Boone, Iowa, on January 7, 1947, my attention was attracted to two Long-eared Owls (*Asio otus wilsonianus*) that flushed from a large red cedar. The fox trail continued directly under the owls' roost where it was evident that the fox inspected the pellets and possibly searched for uneaten food remains. The fox defecated among the pellets and then continued on its way.

The opportunistic tendencies of red foxes in taking advantage of situations promising to yield food have been observed before. This visit to this Long-eared Owl roost by the red fox encouraged more than average interest in the possibility of such a relationship with the owls. The number and estimated age of the pellets beneath the tree indicated that the owls had probably not been using the roost in the red cedar for more than about two weeks. Wilson (Auk, 55: 189, 1938) found that these "— owls never used one roost more than two or three weeks . . . " Unfortunately, the owls continued to use the roost only until January 16, 1947, when they were last seen. No pellets were found beneath the roost after that date. Evidence that the foxes had visited the roost again during occupancy by the owls was not found; however, track 'sign' is quickly lost under new fallen or shifting snow such as occurred at this time.

A total of 55 owl pellets were collected from beneath the roost, and these provided data on the food habits of the owls. The bulk of the prey taken was mice (94.8%). By per cent of frequency of occurrences these were largely meadow mice (*Microtus* spp.) (51.6%) with equal representations of harvest mice (*Reithrodontomys megalotis*) (20.2%) and white-footed mice (*Peromyscus* spp.) (20.2%). Remains of the house mouse (*Mus musculus*) occurred once. A record was made of the numbers of individual mice represented in the pellets by teeth and skull fragments. A total of 105 mice were represented: 2 undetermined mice, 58 meadow mice, 24 harvest mice, 20 white-footed mice and 1 house mouse. Examination of the enamel outline of the molar teeth showed 26 of the 58 meadow mice were *Microtus pennsylvanicus* and 30 were *Microtus ochrogaster*. The remains of three perching birds were identified in

the owl pellets: One undetermined, one Tree Sparrow (*Spizella arborea*), and one Goldfinch (*Spinus tristis*).

TABLE 1

PERCENTAGES OF OCCURRENCES OF FOOD REMAINS IN PELLETS OF 55 LONG-EARED OWLS AND IN FECAL PASSAGES OF 21 RED FOXES, MOINGONA AREA, LATE DECEMBER TO EARLY JANUARY, 1946–1947.

	Long-eared Owls	*Red Foxes*
MAMMALS	94.8	90.0
RODENTS	94.8	38.7
Undetermined	1.7	8.9
Determined	93.1	29.8
Fox squirrel	0.0	8.1
Harvest mouse	20.2	5.4
White-footed mouse	20.2	5.4
Meadow mouse	51.6	10.8
House mouse	1.1	0.0
RABBITS	0.0	51.3
Cottontail	0.0	51.3
BIRDS	5.2	10.0
Undetermined	0.0	5.0
Determined	5.2	5.0
GALLIFORMES	0.0	5.0
Domestic Chicken	0.0	5.0
PASSERIFORMES	5.2	0.0
Undetermined	1.7	0.0
Determined	3.5	0.0
Tree Sparrow	1.8	0.0
Goldfinch	1.8	0.0

The basic dietary pattern of these Long-eared Owls did not differ from the findings of Wilson (*op. cit.*), Errington (Condor, 34: 176–186, 1932; and 35: 163, 1933) and Pearson (Journ. Mamm., 28: 137–147, 1947).

For purposes of comparing the diet of the red fox with that of these Long-eared Owls, 21 fecal passages of the foxes were collected during the period represented by the pellets (*See* Table 1). The principal difference in the kind and proportion of foods taken by the two predators seemed to have been brought about largely through a limitation as to size of prey captured. The owls did not feed on cottontail (*Sylvilagus floridanus*) while this prey species comprised the staple food for the fox. Inasmuch as remains of cottontails were left uneaten by the fox it seemed evident that the owl either did not find these remains or did not feed on them if found. Mice occurred with greater frequency in the diet of the owls; however, the relative proportions of specific mouse occurrences showed a tendency to be about the same for both predators.—THOMAS G. SCOTT, *Iowa Cooperative Wildlife Research Unit, Ames, Iowa.*

Purple Martins killed on a bridge.—In the July, 1947, issue of 'The Auk' a note by Dr. M. A. Jacobson is published on Purple Martins killed on a highway bridge across Albemarle Sound, N. C. The conclusion reached was that the birds were roosting on the railing and flew into the headlights of passing cars at night. I have observations which lead to a different conclusion for at least part of the mor-

tality. On August 16, 1941, Dr. E. G. Davis and I crossed this same bridge over Albemarle Sound just at sunset. A very large flock of Purple Martins was circling down and roosting on the timbers and rafters *under* the bridge, not on the railing. As we approached the southern end of the bridge, a threatening thunderstorm broke and the still circling birds were forced lower and lower until many were struck by cars and a few landed unharmed but drenched on the roadway. On returning on foot, we counted 173 birds on the bridge; 169 were dead, either struck in the air or crushed on the ground, and of the other four, two were injured and died shortly afterward, whereas the other two flew away after dusk when partially dried out. After dark, there were no birds on the railings or flying about, but many hundreds could be seen by flashlight on the timbers underneath the bridge.—Dr. Norman P. Hill, *Arlington, Massachusetts.*

Unusual nesting behavior of a Wood Duck.—The Indiana Department of Conservation, coöperating with the Illinois Natural History Survey, released on the Jasper-Pulaski Game Preserve in Jasper County, Indiana, 95 Wood Ducks (*Aix sponsa*) at the age of 11 weeks on July 14, 1944. Frank C. Bellrose, Jr., of the Illinois Natural History Survey, collected eggs from nests of wild Wood Ducks in Illinois and raised the young ducks used in this experimental release. The collection of records in Indiana was conducted by O. D. McKeever as an activity carried out in connection with his Pittman-Robertson Wildlife Research investigation of waterfowl.

The following year, on May 5, 1945, Mr. McKeever captured one of the previously banded birds, bearing U. S. Fish & Wildlife Service band 41–602047, in Wood Duck nesting box No. 17 erected on this same game preserve. It had a nest containing 12 eggs. On May 11, 1945, eight eggs were pipped and three eggs showed no signs of incubation. One newly hatched young, with a piece of egg shell still attached, was also found dead on the ground under the box. On May 12, eight young were found in the box and the other three eggs were removed and placed in a semi-domesticated Mallard nest at Wallace Lake, a display pond, located in another part of this game preserve. These three eggs did not hatch until May 25, 1945, indicating that more than one hen had been laying in this nest. On May 14, seven young were still in the nesting box and one young was dead. The adult female was nowhere in evidence; consequently, the seven live ducklings were removed to an electric brooder. It is believed that the inner surface of the yellow poplar lumber used for construction of the box did not afford enough rough surface for the young ducklings to climb out of the box and that they were abandoned by the mother.

On July 7, 1945, Mr. McKeever again captured this same adult female in nesting box No. 37, three-fourths of a mile from the original nesting box No. 17. She was incubating eight eggs. Upon re-inspection of the box on July 17, it was found that three eggs had hatched, probably two or three days previously, and the young were successful in leaving the box. Of the five remaining eggs, four were infertile and one showed imperfect hatching.—Wm. B. Barnes, *Project Leader, Indiana Pittman-Robertson Wildlife Research Project, Indianapolis 4, Indiana.*

Polygamy at a Groove-billed Ani nest.—Near the middle of August, 1947, I saw some Groove-Billed Anis (*Crotophaga s. sulcirostris* Swainson) causing much clatter in a tree with abundant foliage and many bunches of long, dried capsules. At first I though the birds were chasing insects, but as they persisted about this tree for some days, I began to suspect something about a nest, and decided to watch them closely. On August 15—a bright day—the birds started work about 8:00 A.M.

Three birds arrived from a near-by field and began hopping in the branches, climbed to the treetop and, in the sun, started preening their plumage. This continued for a time; then suddenly one of the birds dashed against one of the bunches of dried capsules, bit and pulled until it broke off a stick, then flew with this in its bill to a branch with heavy foliage. So I confirmed my suspicion that they were building a nest.

Soon there were two birds working hard while the third remained preening in a branch in the vicinity of the nest. At about 9:00 A.M. the three birds flew out to the near-by field. They returned one hour later and perched in a tree some ten meters distant from the nest. Up to this time I had thought they were two adults and perhaps a young of a previous nest, but now, watching them carefully, I saw that the three had very worn plumage. Then, dispelling my last doubt, one of the birds approached one of the others and, after some mutual preening, copulated; then to my astonishment, he flew toward the third bird and again copulated. It was evident that there were two females and a male.

After some minutes the three flew to the nest. One female sat in the nest and arranged the material the other brought, sometimes receiving it in her bill and now and then going out of the nest and bringing dried sticks from the near-by bunches of capsules. Meanwhile the other female made one trip after another, bringing from a near-by tree fresh green leaves which she cut in bunches.

In the meantime the male was perching on a branch in the vicinity of the nest, watching the females working and now and then calling. Sometimes the two females both carried material but never of the same kind, one bringing fresh green leaves and the other dried sticks; both materials were gathered high up in trees in the vicinity. This hard work continued during all the morning, with now and then a little rest.

About noon they stopped work and perched close together in a branch near the nest. Suddenly the male copulated with one female and then at once with the other. After a time the three flew toward the field, and for the rest of the afternoon they did not return.

Next day all was about the same, but I saw three copulations with both females. The females worked hard all morning, but in the afternoon not one bird was seen in the vicinity of the nest. This promised an interesting study, but unfortunately that night there came a heavy storm with rain and many branches of trees were broken, including the branch that held the nest, which was on the ground. The birds were not seen again.—Miguel Alvarez del Toro, *Museo de Historia Natural, Tuxtla Gutierrez, Chiapas. México.*

House Finches "drinking" peaches.—I watched a female Common House Finch (*Carpodacus mexicanus frontalis*) feeding on my peaches this morning (July 26, 1947). From a distance of seven or eight feet I watched her every motion as she sat on a horizontal limb on a level with my eye, feasting with apparent relish on an Elberta directly in front of her. The peaches were firm, just ripening, and not yet advanced to what might be called the juicy stage. Each bit of peach which she removed from the fruit was pressed rapidly and intermittently between her mandibles. Her throat muscles indicated the drinking process. After desiccating each piece of pulp or skin, she discarded the residue with a shake of the head. Although she must have consumed some of the peach pulp she appeared to be seeking only the juice.

When she flew after about eight minutes, I picked the peach. It had been opened on the rosy or blush side. The opening was completely to the stone and was about one by one and a half inches. The skin around the perimeter of the opening was neatly cut and notched as though done with pinking shears.

My berries and apricots have suffered much each season by depredation of House Finches. In fairness to the multitude of English Sparrows which frequent my yard, I should state that I have never observed them feeding on my fruit.—EMERSON A. STONER, *Benicia, California.*

Wood Duck courting a Mallard.—During the last two winters a male Green-winged Teal (*Anas carolinensis*), presumably the same bird, has remained with the hundreds of tame Mallards (*Anas p. platyrhynchos*) wintering at Forest Park, Springfield, Mass. This winter a male Wood Duck (*Aix sponsa*) has also been present there; and a Ruddy Duck (*Oxyura jamaicensis rubida*) was identified at the same place by Miss Fannie A. Stebbins on Dec. 17, 1947.

All this was interesting enough. But today (Feb. 26, 1948) I witnessed an example of complex relationship which seems worth recording. The male Wood Duck was courting a female Mallard; the male Green-winged Teal was driving off all drake Mallards which approached this oddly-matched pair. The Teal showed no interest in the Mallard and no animus against the Wood Duck.

When first observed, the three were standing on the ice about 150 feet from me. The Wood Duck practically leaned against the bigger Mallard, while the little Teal stood a foot or so away from the former. Presently all three arose together and flew over to a stretch of open water where my daughters were feeding bread to the Mallards. Here I watched them for 20 minutes, at an average range of 15 feet. The Wood Duck never left the side of his hefty 'lady,' but remained close to her, repeatedly whistling and squeaking, wherever she swam. The Teal, meanwhile, continued to be a self-appointed escort for the pair, forcing any near-by drake Mallard to turn away by rushing at him with lowered head. When, at length, the Wood Duck and Mallard climbed out of the water onto the ice, their midget guardian followed them. And when I left, the three birds were standing as I first saw them: the pair close together, the Teal a foot or so away.

Kortright (1943: 152) says: "The Mallard crosses freely with other species, especially with its near relative, the Black . . . Crosses with the Gadwall, Pintail, Baldpate, Green-winged Teal and other species are also known."

Apparently the Wood Duck may be included among those "other species" with which the Mallard crosses. One wonders if it might not do so with all the *Anatinae.*

But how may we interpret the action of the Teal?—AARON MOORE BAGG, *72 Fairfield Ave., Holyoke, Massachusetts.*

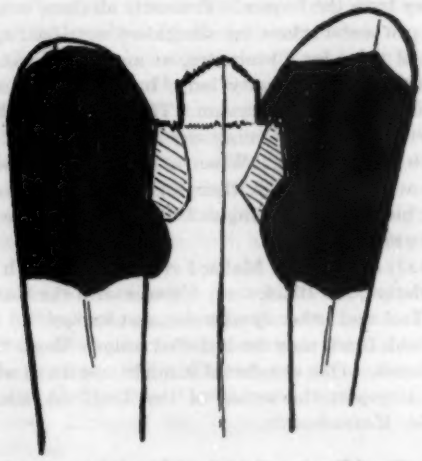
The Quails of the Sinai Peninsula—Another interpretation.—Mr. Chapman Grant's note in The Auk for January, 1948, entitled "Those tall Sinai quails" gave two alternative interpretations of a passage in the Book of Numbers (XI: 31) both of which seemed to me unlikely to be correct The Vulgate of St. Jerome certainly uses the word "volabant," which can have no other meaning than "flew" or "were flying," and that would make more sense than to assume that the birds *stood* two cubits high, but it presents so different a picture from the one I get from the King James version that I couldn't accept it as the true rendering. I therefore consulted a recognized authority on the Hebrew language and literature, Dr. Robert H. Pfeiffer, a lecturer on the Semitic languages in Harvard University and Curator of the Semitic Museum there. He writes me:

"I would suggest that Numbers XI: 31 should be translated from the Hebrew as follows: 'And a wind went forth from the Lord and it brought quails from the sea, and dropped them by the camp, all around the camp one day's journey in each direc-

tion so that they covered the ground to the height of two cubits.' You are right in surmising that the Hebrew text means that the quails were spread pretty evenly all over the ground to the height of two cubits. You may be right in figuring that according to the text [v: 32] 66,000,000 bushels of quails were gathered. I leave the mathematics to you. In any case, it is recognized by modern historians that the Israelites in the desert with Moses did not number, as the text [XI: 21] with incredible exaggeration reports, 600,000 footmen, but probably less than one hundredth of that impossible figure. Late biblical authors (such as this one) love great figures. The Hebrew word *salwim* in Numbers X1: 31–32; Exodus XVI: 13; Psalms CV: 40, (translated 'quails') is generally identified with the *Coturnix communis*."

My figures of 66,000,000 bushels were reckoned on 10 homers of 11 bushels each for each of the 600,000 men. If there were only 6000 men gathering 10 homers apiece, 660,000 bushels would indicate pretty good hunting. Even if the quails were not tall themselves, the story is a tall one!—FRANCIS H. ALLEN, *West Roxbury 32, Massachusetts.*

Abnormal rectrix of Sparrow Hawk.—Sutton and Arnold (Auk, 55: 281, 1938) and Shortt (Auk, 59: 438, 1942) report abnormally developed primaries in a Blue Jay



TEXT-FIGURE 1.—Abnormal rectrix of Sparrow Hawk.

and Ring-billed Gull, respectively. While examining Sparrow Hawk skins in the Louis Agassiz Fuertes Memorial Collection (Dept. of Ornithology, Cornell University) I found a specimen labeled *Falco sparverius paulus* (C. U. No. 1132) with an abnormal tail feather. The bird, a male from Dade County, Florida, was collected by Mr. Fuertes on March 26, 1908. This skin is normal in all respects except for the peculiar rectrix, which is striking because it has no subterminal black band. The tip of the feather is very worn, and a mark of weakness shows about eight mm. from the end. The worn area is rufous in color, and where the band would normally be situated are two patches of gray, one on each side of the rachis, with a small spot of black at the proximal end of each. (*See* Text-fig. 1).

There is no positive way of accounting for this odd feather unless it was caused by injury to the developing follicle, in which case it is difficult to explain how the feather

could have grown to almost normal length. The excessive wear shows, however, that this feather was weak in structure as well as unusual in color pattern, and as only one rectrix is affected, local injury is probably the correct answer.—IRWIN M. ALPERIN, *Brooklyn, New York.*

A partial Albino Robin.—On August 15, 1939, an adult male Robin (*Turdus migratorius*) was trapped and banded. This bird was a partial albino—its body nearly all white, some red on the front of the breast, part of the forehead dark, and the wings and tail showing the only normal coloring. A short motion picture in color was taken of this bird when captured because of its unusual markings. This bird never again entered the traps since the day when first captured, but for the next eight summers a Robin marked exactly like this and wearing a band has been seen at various times each year around the banding station. It arrived annually about April 1, except in 1946 and 1947, and has been seen almost daily during each of the eight summers. I have never found its nest but its headquarters were mostly on the western part of our ten-acre farm, some two hundred yards from the trapping area. It was a breeding bird, as on several occasions it nested in near-by gardens; this was reported to us each year after the young had flown. Also each time the report came in that the young had been normally colored.

While this must remain entirely a sight record, yet each year we have been sure to see that the bird still wore a band; also each year we have reviewed the motion picture to make a careful comparison with the present markings and note that there has been no change through the years. Consequently we have no hesitancy in placing this on record.

The following dates are those of annual return: April 1, 1940; April 2, 1941; March 30, 1942; April 5, 1943; March 23, 1944; April 1, 1945; June 1, 1946; May 4, 1947. This bird is now at least nine years of age.—RAYMOND J. MIDDLETON, *Norristown, Pennsylvania.*

An albino Cliff Swallow.—On July 31, 1946, a woman brought to me an albino Cliff Swallow which she had captured in a shed near her house, about three miles southeast of Bennington, Vermont. The bird was uninjured. It was pure white all over, although it did not have pink eyes.

It was kept overnight and released the following day, and it has not been seen since.—LUCRETIUS H. ROSS, *Bennington, Vermont.*

Orchard Oriole nesting at Madison, Wisconsin.—The Orchard Oriole (*Icterus spurius*) has always been considered a rare spring migrant on the University of Wisconsin Arboretum at Madison, Wisconsin, but during the spring of 1947 one pair nested on the area. On June 14, I saw a female constructing a nest in a 12-foot hawthorn (*Crataegus*). The nest was on the east side of the tree seven feet from the ground. It was about one-half built. The male of the pair was an immature bird and was not at all shy. It did little calling and on my several visits to the nest area it was never heard to sing. The nest contained four eggs on June 23. At that time, too, a Kingbird was seen to flush the female from the nest tree. Subsequent visits to the nest always found the Kingbird harassing the orioles. On July 12 the nest contained three live but slightly emaciated young of varying size and a dead nestling (apparently the youngest) which was very thin. The largest bird was about a week old. At this time no parents were about and I chased a Kingbird from the nest tree. Three days later the nest contained one dead nestling. The larger two perhaps fledged, but a search of the area showed no sign of young or adults. The belligerent Kingbird, however, was still in the vicinity.

Another completed Orchard Oriole nest was found (James B. Hale) on July 18, 150 feet southeast of the original nest. This one was seven feet from the ground in an 11-foot wild crab apple tree and was empty when found. No eggs were ever deposited in the nest nor were any adults ever seen in the area. I believe this nest was built after the orioles abandoned their first brood, but that the Kingbirds also thwarted the renesting and the orioles left. It is unfortunate that the first known breeding of an Orchard Oriole on the University Arboretum should have been disrupted by the Kingbird. It is interesting to speculate whether this kind of interspecific strife may determine breeding densities, habitat preferences, range, etc., of many of the songbirds.—ROBERT A. MCCABE, *Madison, Wisconsin.*

Prothonotary Warbler's Nest in Wood County, West Virginia.—On May 4, 1947, as we were observing birds in a swamp along the Ohio River in Wood County, West Virginia, we found a pair of Prothonotary Warblers. At the time, indications pointed to a nest being constructed, and on May 12, 1947, we were able to prove that such was the case. This is one of the few definite reports of this species for West Virginia, and the first nest.

It was inevitable that this bird, known to nest in eastern Ohio, western Pennsylvania, etc., would show up some day in West Virginia, and we were endeavoring to find it at the time we entered the swamp. The location is swampy woods in a section hit by spring floods, with the nest in a water-surrounded stump. It lies along U. S. Route 21 in northern Wood County, one mile north of the town of Boaz and ten miles north of Parkersburg. At this point the road parallels the Ohio River at a distance of some 400 yards. The swamp lies between the two and equidistant from them. It is one part of a section of standing water, maintained solely by rainfall, which extends for a total of three-fourths of a mile and which never exceeds 30 yards in width.

The shallow nest was placed three feet down in a six-foot stump which inclined to the east, and the eastern side was decayed and broken out, from the top, halfway down. The other side of the stump, the shoreline side, was intact, thus giving protection from prying eyes as well as storms. On May 12 the water covered the base up to eight inches and the shore was some five or six feet away. Later, after some rain, we found the water to be 10 or 11 inches deep and dry land 10 feet away.

There were six eggs on May 12 and this number never changed. However, only four were warbler eggs; the other two were those of Cowbirds. This nest was under surveillance until late evening of May 20 at which time our vacation ended and we were forced to leave without having seen an egg hatch. On May 20 we eliminated the Cowbird eggs and the female Prothonotary resumed incubation without seeming concern over this fact. She was always very hard to flush.

The only previous West Virginia records for this species include one made by Doan near Buckhannon, Upshur County, in 1887 (now discredited); a report of a single individual by Randle from Cranberry Glades, Pocahontas County, in 1943; and a report of a male from Jefferson County, near Shepherdstown in 1946, by Miss Serena K. Dandridge.—LOUISE AND ALSTON SHIELDS, *Charleston 1, West Virginia.*

First record of Anhingidae in Micronesia.—The third and revised edition of 'A Hand-List of the Japanese Birds' (1942) fails to list any member of the Anhingidae from the Pacific Islands formerly under Japanese Mandate, and as far as I know there are no specimens of this family in collections from that area. It may be of interest, therefore, to record that during the course of a survey of these islands for

the Pacific War Memorial and the National Research Council, I spent a day, Nov. 12, 1946, on Babelthuap Island in the Palau Archipelago. In a swamp edged with large, old trees, I saw about a dozen anhingas (presumably *Anhinga melanogaster*) sunning themselves and perching in the upper branches. Two birds were soaring on the warm updrafts. The area looked quite suitable for supporting a small nesting colony.—S. DILLON RIPLEY, *Peabody Museum, Yale University, New Haven, Connecticut*.

Extension of breeding range of the Inca Dove.—The Inca Dove (*Scarcafella inca*) was formerly confined, in southern Texas, to the region between San Antonio and the Rio Grande. The first record of the dove for Austin, Texas, was in 1889, while by 1909 it had become a common nester in that region (Bent, 1932). Bent gives southern Texas (Kerrville [Kerr Co.], Austin [Travis Co.], and Columbus [Colorado Co.]), as the northern limits of distribution, and Columbus and Santa Maria [Cameron Co.], Texas, as the eastern limits. Davis (1940) makes no mention of this species in Brazos County, Texas. Oberholser (1938) says that it is entirely accidental in Louisiana.

During the winter of 1946, several small flocks of Inca Doves were observed in the city limits of Bryan, Texas, feeding on the seeds of the hackberry (*Celtis mississippiensis*). Four to eight birds comprised these flocks, which fed boldly to within 15 feet of the kitchen window. At this time, it was not considered unusual to see these birds in winter, as they had been reported by various observers during the last four years.

On March 20, 1947, a pair was observed in Bryan, Texas, the county seat of Brazos County. The male was strutting on a limb of a hackberry, carrying his fanned tail at the vertical position and uttering the guttural growl note which is associated with courtship, while the female patiently watched the performance. Shortly, the two flew to the ground and fed on the seeds of the tree, but the amorous male continued to strut, on the ground, and twice pursued the female in short dashes. A Mourning Dove joined the two feeding birds with no evidence of friction. After ten minutes of feeding, the two Incas flew back to the hackberry tree and contented themselves with the incessant cooing which characterizes the species.

On April 11, 1947, two birds were seen and heard calling in Bryan, and the same day one Inca was observed on the Texas A. & M. campus, at College Station, four miles south of Bryan.

On May 14, at 8:30 A. M., one of this species was seen carrying nesting material, which consisted of liveoak twigs, some with the leaves attached, in its bill. Each twig was deposited on a crude platform 15 feet from the ground and 16½ feet out on the horizontal limb of a juniper (*Juniperus virginiana*) which stands in front of Science Hall on the A. & M. campus. Both male and female were present, the male making five round trips in ten minutes with nesting material, while the female remained at the nest location. She was straightening and shaping the new material into place, as the male simply dumped the material near her. This was evidently the first day of construction. At 6:30 P. M. of the same day, there was no activity, and neither bird was seen on or near the nest. By the 19th, the nest was complete and the female was incubating. On the 27th of May, the young were at least one day old. On either June 10 or 11, the young left the nest, but stayed in the nest tree for 24 hours before disappearing.

On June 16, a second clutch of two eggs was being incubated in the same nest. These were photographed and observed for three days, after which time they disappeared.

In a personal conversation with Fred L. Cavitt of Bryan, it was disclosed that this

species has nested in his back yard for the last three years, at least. Dr. C. C. Doak, head of the biology department, states that he has seen them for a number of years in the vicinity of College Station, but never has been able to locate the nest.

These records constitute a northeasterly extension of breeding range for this species. Bryan, Texas, lies approximately 85 miles east-northeast of Austin, Texas, and 67 miles north-northeast of Columbus, Texas, the previous northern and eastern limits of the range.

LITERATURE CITED

BENT, A. C.
1932. Life histories of North American Gallinaceous birds. U. S. National Museum, Bull. 162: 444–450.
DAVIS, W. B.
1940. Birds of Brazos County, Texas. Condor, 42: 81–85.
OBERHOLSER, H. C.
1938. The bird life of Louisiana. State of Louisiana, Dept. of Conservation, Bull. No. 28: 322.

—FRANK W. FITCH, JR., *Bryan, Texas.*

Hawk Owl in Illinois.—During the cold weather of January, 1947, a Hawk Owl (*Surnia ulula caparoch*) appeared on the farm of Russell S. Davis, well-known bird-bander and trap maker, at Clayton, Illinois. It remained for nearly three weeks during the severest weather. The bird roosted on the root of a large tree exposed under a creek bank. It was observed by a number of interested bird enthusiasts both while feeding, roosting, and while coursing the fields. Because of these opportunities the identification was positive. The bird was a swift flyer, hunting by day, and was observed eating rabbits and Starlings. This is the first record of this bird for Adams County if not for Illinois.—T. E. MUSSELMAN, *Quincy, Illinois.*

Kingbird wintering in Florida.—The stated winter range of the Eastern Kingbird (*Tyrannus tyrannus*) is "from southern Mexico to Colombia, British Guiana, Peru and Bolivia" (A. O. U. Check-List, 1931). It therefore seems advisable to report a record from southern United States. On February 5, 1947, my wife and I observed an Eastern Kingbird eighteen miles south of Tallahassee, Florida, on the highway to the Gulf. The bird was well seen and heard on wires alongside the road. The previous night had been cold but insect life was reappearing and the bird was feeding actively. It did not appear injured or in any way abnormal.—Dr. NORMAN P. HILL, *Arlington, Massachusetts.*

Smith's Longspur in North Carolina.—One of the birds which I least expected to see anywhere in the Southeast was Smith's Longspur (*Calcarius pictus*). However, on December 28, 1946, in an overgrown airport about two miles southwest of Lumberton, Robeson County, North Carolina, I had the good fortune to observe one of these birds. The location was approximately two hundred yards from the highway and twenty yards from a small patch of flooded woodland, and the bird was in the company of a flock of 15 or 20 Slate-colored Juncos. I was equipped with a pair of 6 x 30 binoculars and quite often was able to approach within fifteen feet of the longspur and juncos. Upon seeing that it was a longspur, I noted the buffy under side and the tail pattern, in contrast to those of the Lapland Longspur, and identified it as Smith's with the aid of Peterson's 'Field Guide.'

The most unfortunate part of this occurrence was my failure to collect the bird. I had been combing the field with three friends who were carrying shotguns, but they had gone ahead when I had stopped. On realizing the desirability of securing the specimen, I hurried after them and was met by a burst of gunfire around me. Startled,

I looked up to see a flock of almost three hundred Meadowlarks rising and being fired upon not only by my friends but by nine other wild-shooting hunters also. I flattened myself in a fairly dry ditch until the barrage ceased, and when it was over neither the juncos nor the Smith's Longspur could be found.

The nearest definite records seem to be in Chester County, South Carolina, where Loomis took a specimen on December 1, 1880, and another on February 9, 1889 (Wayne).

My record was listed in the May, 1947 'Audubon Field Notes', Carolinas Section, as the first state record, by Mr. E. B. Chamberlain of the Charleston Museum, but he failed to say which state. Upon searching for information on the status of the bird in North Carolina, I found this note in the May-June, 1946 'Field Notes' about the Smith's Longspur in North Carolina: "In mid-January, J. C. Crawford saw 6 birds digging through half a foot of snow on his farm near Statesville (Miss Anderson) to get at oats dropped from a drill; from a book illustration he determined them to be Smith's Longspurs." Doubts arose in my mind when I saw in the May, 1946 'Chat', North Carolina publication, the following note: "Lapland Longspurs at Statesville, North Carolina. J. C. Crawford reports seeing six Lapland Longspurs on his farm one day this winter after a snow. The birds were digging under the snow for seeds. Grace Anderson."—GEORGE B. RABB, *Charleston Museum, Charleston 16, South Carolina.*

More about the Broad-winged Hawk in South Carolina.—After reading the article by Mr. Alexander Sprunt, Jr., on the winter occurrence of the Broad-winged Hawk (*Buteo p. platypterus*) in South Carolina in the July, 1947, issue of 'The Auk,' the writers felt it proper to add their own records of this hawk in South Carolina to the very few which have been published.

The record of ours which has the most bearing on Mr. Sprunt's article was made on February 22, 1947, a mile east of the John P. Grace Memorial Bridge spanning the Cooper River on U. S. Highway No. 17–701, Charleston County. We observed two birds of this species through 6 x 30 binoculars on this cold and windy day (for Charleston) for about ten minutes as they soared about; our observation ended when they disappeared into a pine forest.

The first time we saw this hawk was on September 8, 1946, at Old Town Plantation, Charleston County, in the company of Mr. Henry Hill Collins, 3rd, of Lanham, Maryland, and Mr. Newton H. Seebeck, Jr., of Charleston. Our most recent view of a Broad-wing came while on a collecting trip to the Piedmont section of the state. We saw this bird sailing at a height of not more than thirty feet above State Highway No. 31, about a mile and a half northwest of Cameron, Calhoun County, on April 25, 1947.

Mr. Sprunt said of his two winter records: "They apparently constitute the only winter records for the state." However, we find that besides our later observation on February 22, there was at least one other winter record for South Carolina from Mr. A. C. Bent's 'Life Histories of North American Birds' (1937). This was made by Wayne, who took a specimen on January 15, 1889, near Charleston.—GEORGE B. RABB AND JAMES E. MOSIMANN, *Charleston Museum, Charleston 16, South Carolina.*

The White Pelican in the interior of Chiapas, México.—During the middle of February, 1947, several flocks of White Pelicans (*Pelecanus erythrorhynchus*) were seen flying above the valley of Tuxtla Gutierrez. They were noted for about a week flying in all directions, apparently lost and exhausted, because many birds now and then came to earth; some flocks alighted as far from water as the mountains of Villa

Allende—a town about twenty five kilometers northwest of Tuxtla. Other pelicans reached the large River of Chiapa and stayed there for some days. Of course many of the birds that alighted on dry ground were slaughtered by relentless natives.—MIGUEL ALVAREZ DEL TORO, *Museo de Historia Natural, Tuxtla Gutierrez, Chiapas, México.*

Notes on two species in Puerto Rico.—Having resided many years on the south coast of Puerto Rico (until August, 1947) I was much interested in the article by Ventura Barnés on Puerto Rican avifauna in The Auk of July, 1947. On two of the species he lists I have notes.

Cape May Warbler.—Seen only twice, on both occasions near Guanica. Once, January 29, 1924; the other, April 20, 1934. Apparently the species is rare along the coast but common in the higher interior of the island.

Puerto Rican Short-eared Owl.—I have three records and three reports from others between 1919 to 1925, indicating that it was not very rare along the eastern part of the south coast in those years. No records since 1925, perhaps due to little time for observations. It was seen August, 1919, nine miles west of Guayama; April 25, 1922, four miles east of Guayama; and July 5, 1925, three miles northwest of Santa Isabel. The three reports came from points between Santa Isabel and Salinas. Altogether these three accounted for six or eight owls. My records were all of birds flushed in pastures, two near cane fields, and one from a partly wooded valley pasture. The three reports were also from pastures. An excerpt from my note of April 25, 1922, says: "It rose over my head calling '*keck keck*' four or five times in a tone almost like a toy trumpet."—F. A. POTTS, *Waupaca, Wisconsin.*

Yellow-headed Blackbird breeding in western Oregon.—For many years the Yellow-headed Blackbird (*Xanthocephalus xanthocephalus*) has been one of the conspicuous breeding birds of the extensive tule marshes east of the Cascade Range in Oregon. Though it often ranges westward into the mountains about the alpine lakes, it has always been considered a rare bird west of the mountains. Shelton (1917) failed to mention this bird as occurring in west-central Oregon, and Gabrielson and Jewett (1940) list it as an "irregular visitor west of Cascades" with a few winter records from near Sweet Home, Portland, and in Curry County.

On May 10, 1947, while checking over the bird population of a marsh at the northeast end of the Fern Ridge Reservoir about eight miles west of Eugene, Oregon, I counted six males of this species. All six were singing and acting very much as though they had mates near by. Revisiting this marsh on May 16, I found a dozen males and nearly as many females. Going into the cattails, I discovered five nests of this species. Three were still empty, but one nest contained one egg and another four eggs.

This area was not visited again until June 12 at which time two males and one female were seen at the southeast end of this same reservoir. On visiting the original colony again on June 14 for the purpose of photographing the adults, I found six nests not located previously. Two had produced young as evidenced by the excreta covering the nests. Two more contained three eggs, each, and the last two nests were still under construction. Several females were observed carrying food for young but the nests containing these young could not be found. The nests in all cases consisted of the dried leaves of the cattail (*Typha latifolia*) woven into a neat but bulky nest. They were usually about 18 inches above the water surface and attached to the stems of dead cattails. Not once was a nest attached to a live stem.

Talking with several persons living in this area before the Fern Ridge Dam was

built (1940–1942), I learned that these birds were not uncommon in the old Coyote Creek Marsh, now covered by this reservoir. No one seems to know how long they have been in this area as breeding birds.

REFERENCES

GABRIELSON, IRA N., AND JEWETT, STANLEY G.
1940. Birds of Oregon. Oregon State Monographs, Oregon State College, Corvallis, Oregon.

SHELTON, ALFRED C.
1917. A distributional list of the land birds of west central Oregon. University of Oregon, Eugene, Oregon.

—GORDON W. GULLION, *Eugene, Oregon.*

Florida Gallinule in Utah.—On June 24, 1947, the writers, accompanied by Noland Nelson, Utah Fish and Game biologist, sighted a Florida Gallinule (*Gallinula chloropus cachinnans*) in Unit I of the Ogden Bay Bird Refuge, five miles northwest of Hooper, Utah. This bird was sighted on the shore of the lake at about 30 yards distance. Identification was positively made by the three observers with the use of a pair of 9 x 35 field glasses. Further identification was made when the bird was again flushed from a distance of 10 yards. This constitutes the first known record of the occurrence of the Florida Gallinule in Utah.—CLARENCE COTTAM AND JESSOP B. LOW, *U. S. Fish and Wildlife Service.*

Townsend's Warbler in Brooklyn, New York.—On the morning of May 8, 1947, while birding in Prospect Park, Brooklyn, N. Y., during a cold North-west wind, I observed a warbler fly in and land with a loud *chip* near the top of a tall evergreen. With 7 x 50 coated binoculars it was immediately apparent that the bird had a yellow face and under parts, with a black cap, throat, and cheek patch. In the ensuing half hour, the bird descended to lower levels and fed with other warblers in a sycamore maple, and thus afforded excellent views. It was unquestionably a male Townsend's Warbler.

Cruickshank ('Birds around New York City': 389, 1942) mentions the bird seen by Dr. W. T. Helmuth at East Hampton, Long Island, on August 18, 1934, as undoubtedly correct, but quotes Dr. Helmuth's suggestion that "if the species be mentioned at all . . . it be relegated to the hypothetical list." He mentions two other eastern records—one bird collected in Pennsylvania and one seen in Massachusetts.

Considering the rarity of this Pacific Coast accidental, I was extremely fortunate to substantiate this record upon returning the following morning with Mr. Walter Sedwitz and observing the bird in the same area. That afternoon further confirmation was made by Mr. Geoffrey Carleton. The next morning, May 10, Mr. I. Alperin, Mr. W. Sedwitz and myself again located the bird, and a few hours later it was carefully observed by eight members of the Brooklyn Bird Club.

The bird ranged from tree-tops to the very ground, itself. Everyone had ample opportunity to make detailed plumage studies. Although the specimen was not taken, I would like to suggest that this easily identifiable bird, observed by a dozen competent observers, be given place among the birds listed for New York State.—DR. M. A. JACOBSON, *New York, N. Y.*

Glossy Ibis breeding in South Carolina.—The first breeding record for the Glossy Ibis (*Plegadis falcinellus*) in South Carolina was made on June 15, 1947, when I found a pair of these birds nesting in Washo Reserve, an old rice plantation backwater or reservoir, near the mouth of the Santee River about 45 miles northeast of Charleston. With the exception of a pair found breeding near Southport, North

Carolina, in 1940, this is the only breeding record for the Southeast north of Florida.

I was observing a large colony of White Ibises, Snowy Egrets, Louisiana, Little Blue and Black-crowned Night Herons when I saw first one then another Glossy Ibis among the hundreds of birds in the air above the rookery. During the next four hours I saw the two Glossies repeatedly and their behavior indicated beyond a reasonable doubt that they were nesting in a certain part of the rookery where hundreds of White Ibis and heron nests, with both eggs and young, were placed in low thickets of myrtle (bayberry), buttonwood, maple and willow. It was impossible at the time to determine which one of these many nests belonged to the Glossies, which were much shyer than the White Ibises, circling in the air at a pretty good height and refusing to come down to their nest while my boat was visible. The bushes were growing on floating islands which would not bear a man's weight, the water was deep and the growth so thick that it was almost impossible to force the boat through it.

On July 3 I returned to the rookery with Alexander Sprunt, Jr., E. Burnham Chamberlain, Curator of Vertebrate Zoology at the Charleston Museum, Ellison A. Williams and Alexander Sprunt III. One of the two Glossy Ibises showed itself almost at once in the air and, as on the earlier occasion, revealed the approximate location of the nest by circling over a specific part of the area. Nevertheless, it took several hours—a large part of which time was spent by Chamberlain and Sprunt up in trees, whence they could look out over this area of the rookery—to locate definitely the Glossy Ibis nest.

It was about five and one-half feet above the water in a thicket of myrtle (bayberry) and other growths. In it were two young Glossy Ibises (easily distinguishable from the young of the White Ibises), both of them dead. Apparently they had been dead only a few hours, for decay had hardly begun and the bodies were in excellent condition. What had caused their death is a mystery. Although we saw only one parent bird on this second occasion, she was assiduous in her attention to the young even after their death, so it seems certain that they had not lacked food.

The nest, composed of sticks, Spanish moss and grass, and the two young birds—partly fledged and weighing 14 and 15 ounces, respectively—are now in the collection of the Charleston Museum.—HERBERT RAVENEL SASS, *Charleston, South Carolina.*

Oyster-catcher breeding in New Jersey.—On July 26, 1947, at Little Beach Island, Ocean County, New Jersey, William W. Lukens, Jr., Quintin Kramer and I found the nest of an American Oyster-catcher, *Haematopus p. palliatus*. The nest contained three eggs, two of which were pipped—one so far advanced that we could see the bill and head of the chick and hear it peep in the egg several times.

We actually counted four adult Oyster-catchers on the Island, but located the nest of only the one pair on a little mound of sand near a colony of approximately two hundred Black Skimmers and about twenty Common Terns. It was interesting to observe that some of the Skimmers and Terns quite often attacked the nesting Oyster-catchers by diving at their heads while they were standing on the beach, and flying after them when they were in the air. However, the female Oyster-catcher (slightly larger and browner on the back than the male) was not bothered when brooding the eggs.

So far as we know, this is the first record of Oyster-catchers nesting in New Jersey in almost eighty years.—EVELYN Y. KRAMER, *Philadelphia, Pennsylvania.*

The range of the Northern Cliff Swallow in Alaska.—The A. O. U. Check-List gives the range, in part, of the Northern Cliff Swallow (*Petrochelidon a. albi-*

frons) as follows: "Breeds from Cnetral Alaska, the Upper Yukon Valley, north-central Mackenzie, northern Ontario, southern Quebec, Anticosti Island, and Cape Breton Island south over nearly all of the United States . . . "

Bent, in 'Life Histories of North American Flycatchers, Larks, Swallows, and Their Allies' (U. S. Nat. Mus. Bull. 179: 482, 1942) states: "The breeding range of the cliff swallow extends *north* to Alaska (Holy Cross, Rampart, and Bettles); northern Mackenzie (Rat River, Fort Goodhope, Lockhart River, Kendall River, and Artillery Lake) . . . The *western* limits extend north . . . to Alaska (Mount McKinley, Flat, and Holy Cross)."

While working on a Department of the Interior expedition in and near Teller, Alaska, during the summer of 1946, I observed a number of these birds nesting on sea cliffs above Port Clarence, a few miles out of Teller. Apparently this is the first record for this species from the Seward Peninsula, and places the bird within fifty or sixty miles of the northwesternmost extension of the North American continent proper, at Cape Prince of Wales.

The birds were first observed on July 11, while I was camera-stalking cormorants and puffins on higher cliffs near by. They flew within five or six feet of me as I lay in the tundra which fringes the edge of the cliffs, and identification was certain, though no specimens were collected. It is possible, however, that some subspecific differentiation may exist. What the relationship across Bering Straits may be can only be conjectured. The birds are physically capable of the flight to Siberia, and may nest there.

The nests were built on the side of a low cliff, twenty to thirty feet high. Some of them were within eight or ten feet of the water. Owing to difficulty of access, the nests were not examined for young ones or eggs. About half a dozen nests were observed, though others may have been present beyond my angle of vision.

It is evident from Bent's records for Holy Cross, Flat, and Rampart, that the bird ranges through the lower and central Yukon Valley, as well as the Upper Yukon, as given in the Check-List, and up the Koyukuk River at least as far north as Bettles. This means that the bird is almost certainly found on the southern and eastern shores of Norton Sound, and increases the probability of its occurrence in at least the southern half of the Seward Peninsula, which, although it differs from all but the very lowermost Yukon Valley in being almost entirely treeless, tundra country, offers no apparent barriers to a bird of this sort.

Latitudinally, both the Bettles and northern Mackenzie records of Bent are considerably north of any portion of the Seward Peninsula. Not improbably, this bird will be found to range to the northernmost limits of the continent, or very nearly.—Rodgers D. Hamilton, *Museum of Zoology, University of Michigan, Ann Arbor, Michigan.*

Breeding of the Cedar Waxwing in Kentucky.—Although the breeding range of the Cedar Waxwing (*Bombycilla cedrorum*) in the higher mountains extends to northern Georgia, it has not been considered a breeding bird in the lowlands of central and western Kentucky. We have been able to find only seven records of the species occurring in the state in June and July and only one previous mention of an actual nest. Wetmore states that "on Black Mountain, southeast of Lynch, Harlan County, the Cedar Waxwing was fairly common from 3,900 to 4,100 feet, an adult female being taken on June 25" (Proc. U. S. Natl. Mus., 88: 529–574, 1940). Welter and Barbour for Rowan County, also in the eastern mountainous district, reported the Cedar Waxwing as a rare breeding bird but gave no indication that they had ever found a nest (Ky. Warbler, 18: 17–25, 1942). In central Kentucky, Beckham stated

that the Waxwing was "An irregular, but at times very abundant summer resident" in Nelson County (Ky. Geol. Surv.: 1–58, 1885); but Blincoe, who worked a longer time in the same territory, said of the species: "unusually scarce in mid-summer. Beckham did not find it breeding and I found nothing to indicate that it did" (Auk, 42: 404–420, 1925). Gordon Wilson in south-central Kentucky has found the Cedar Waxwing present in the summer only during the 1930 season, when three to ten were seen every day on the college campus at Bowling Green. The senior author noted two Waxwings in both July and August, 1945, at the Otter Creek Recreational Area in Meade County, 25 miles south of Louisville. Monroe has published the only definite nesting record, a nest containing young found in the Crescent Hill section of Louisville, August 19, 1934 (Ky. Warbler, 22: 45–46, 1946).

When Henry Zimmer reported a nest of this species in the process of construction in Jefferson County, about five miles south of the city limits of Louisville, we decided to keep it under close observation, since studies on the habits of a species at the extreme margin of its range might reveal what are the limiting factors to its distribution. The site chosen for the nests was a sparsely settled area surrounded by open farm land. The trees were confined to a strip along the road. A wild black cherry (*Prunus serotinus*) across the road from the nests furnished a large part of the food eaten by the adults, at least. Among the birds nesting in the area were a colony of Purple Martins in boxes, Robins, Catbird, Yellow-throat, Cowbird and a Chipping Sparrow. The first nest was begun on June 15, 1946. It was constructed to a large extent from pieces of soft white string which had been cut into twelve-inch lengths by the Zimmers. Both birds assisted in the nest building. On June 17, one of the Waxwings became entangled in the string and had to be liberated by Mrs. Zimmer. Also during this time a trench for a water line was dug along the street almost under the nesting tree, but neither of these unusual hazards frightened away the pair. The nest was 24 feet up in a red maple on a horizontal limb five feet from the trunk. The first egg was laid on June 22 and the last of the four eggs on June 25. When the nest was examined late that afternoon, an adult was already incubating. On July 15, when the nestlings were six days old, a heavy rain and wind storm blew all four from the nest, killing one of them. Mrs. Zimmer warmed and dried the survivors and her husband returned them to the nest. On July 20 they were again tossed out by another severe storm. This resulted in the death of a second bird. Again the survivors were returned to their nest. The fledglings left the nest on July 24 and were seen until July 30 in the vicinity, identification being rendered certain by bands.

Even before the young birds had achieved their independence, the adults on July 27 began a second nest in a tree 25 feet away. The two juveniles were seen in the tree calling for food as their parents were building. This nest, too, consisted of approximately 80 per cent white string, many pieces of which hung down in streamers. We counted 100 pieces in the nest after the birds had left it. On August 29, the second brood of three birds was well-feathered and one left the nest when we approached it. On August 31, all three young birds had left, but they were still in the tree being fed by their parents. They were able to fly from tree to tree when disturbed.

From the above account it is clear that both broods were successful and five birds were raised. However, two of these would have perished in the storm if it had not been for the intervention of man. We must conclude that Cedar Waxwings find conditions for nest building and raising young suitable in this locality and that there must be other reasons why they do not breed here more regularly.—HARVEY B. LOVELL, *Biology Department, University of Louisville,* and ANNE L. STAMM, *Lakeside, Louisville, Kentucky.*

Additional recent observations on the Smooth-billed Ani in Florida.—The status of this peculiar species has always been something of a puzzle in Florida. Howell (1932) stated that at that time it was unknown to nest in the state, but the writer was fortunate enough to be able to record what seemed to be the only instance of the species breeding there (Auk, 56: 335, 1939). This occurred in the year 1938. More recently, W. E. Dilley (Auk, 65: 313, April, 1948) has reported the occurrence and nesting of the species at Cleniston and Moore Haven.

In late June, 1947, the writer made his annual trip to the Dry Tortugas to make the estimate of the populations of Sooty and Noddy Terns (*Sterna f. fuscata* and *Anous s. stolidus*), respectively. On the 20th of that month, while on Torch Key on the Overseas Highway (Lower Keys), an ani was seen perched on the telephone wires which paralleled the highway. It was about 25 feet from the car and remained for several minutes directly opposite us as we studied it with and without binoculars. The writer was accompanied by his wife and son. The bird was undoubtedly *Crotophaga ani* and not *C. sulcirostris*. Every detail of the configuration of the bill was perfectly observable in the brilliant afternoon sunlight.

On the 22nd, on Bush Key, Dry Tortugas, another ani was seen perched in the mangroves which surround the larger of the two ponds on that small island. On the 25th, while I was again on Bush Key with my son, the ani was again seen at very close range and proved to be *C. ani*. We looked carefully through the tangle of mangroves in the hope that a nest might be located, but we never saw more than one bird at a time and concluded that it was the same individual. During June, 1946, the keepers at the lighthouse on Loggerhead Key assured the writer that a peculiar looking blackbird, which was undoubtedly of this species, had been around the place for several days, and that they had seen it the morning we paid them a visit. Search for it, however, proved unavailing.

At any rate, during this past June (1947), two anis were observed in lower Florida, some distaince apart (approximately one hundred miles) June 20 and 22. As any records of this remarkable bird in this state are of interest, these are given for what they are worth.—ALEXANDER SPRUNT, JR., *The Crescent, Charleston 50, South Carolina.*

Common Terns on Labrador.—Arbitrarily, all records of terns from Labrador are grouped under *Sterna paradisaea* (Arctic Tern) by Dr. Oliver Austin, Jr., in his Nuttall Memoir of 1932 on Newfoundland Labrador birds. He gives as the only definite record of *Sterna h. hirundo* (Common Tern) a specimen taken by Coues at Rigolet in 1860. At Green Island, three miles south of Cartright, Labrador, is a thriving colony of about 200 Common Terns. The local residents about Muddy Bay, who make annual egg depredations on the island, claim the terns have nested there throughout the period of their memory. August 7, 1947, I found the eggs just hatching and secured an adult female (No. 5001 Worcester Natural History Museum) thus establishing the identity of the species.—DAVID KENNETH WETHERBEE, *Worcester Natural History Museum, Worcester, Massachusetts.*

New and interesting records from Colombia.—Among the birds collected for the Carnegie Museum by Mr. M. A. Carriker, Jr., between the years 1911 and 1928, are specimens of four species, three of which were new to the country at the time they were taken, while the fourth species had been taken but once.

Leptopsittaca branickii von Berlepsch and Stolzmann.—Nine specimens were secured on September 18, 1918, at Santa Ignacia, Tolima, in the Temperate Zone of the Central Andes. This record, the first for Colombia, involves a considerable

extension of the previously known range. Our birds agree with the original description and figure, and vary little among themselves.

Touit dilectissima (Sclater and Salvin).—This parrot was not taken in Colombia by Chapman's collectors, although it is recorded from Morunt Pirrí in eastern Panamá. Mr. Carriker secured four specimens at Pueblo Nuevo, Santander, in the Eastern Andes, on August 29, 1916.

Bolborhynchus ferrugineifrons (Lawrence).—One was taken on the Páramo de Ruiz, Tolima, on September 21, 1918. This is the second known specimen of this exceedingly rare species, and it supplies the first definite locality. It is obviously an inhabitant of the Temperate Zone of the Central Andes. In our specimen the bill is damaged. I entirely agree with Miller and Peters in placing this species in *Bolborhynchus*.

Urothraupis stolzmanni von Berlepsch and Taczanowski.—Twenty specimens were taken between September 1 and 25, at Sancudo and Leonera, in the Temperate Zone of the Central Andes, where the species appears to be fairly common. The series includes several birds in postjuvenal molt; the youngest of these indicates that in juvenal dress the species is probably wholly dusky black below, including the throat and breast.—W. E. Clyde Todd, *Carnegie Museum, Pittsburgh 13, Pennsylvania.*

NOTES AND NEWS

THE SIXTY-SIXTH STATED MEETING OF THE A. O. U.

The Sixty-sixth Stated Meeting of the Society will be held in Omaha, Nebraska, October 11–15, 1948. General sessions will be held at the Joslyn Memorial. Hotel headquarters will be the Hotel Fontenelle, four blocks from the Memorial. Less expensive rooms may be obtained at the Conant Hotel, one block farther. Please make reservations early. Chairman of the local Committee on Arrangements is Dr. R. Allyn Moser, R. F. D. No. 1, Omaha 4, Nebraska.

Titles of papers and motion pictures for presentation at the meeting must be in the hands of the Secretary, Dr. Pettingill, not later than September 15 in order to be included in the printed program. The title of each paper should be accompanied by a brief abstract of the paper's contents and a statement concerning the time necessary for delivery and the kind of projection facilities needed, if any. The title of each motion picture should be accompanied by a brief description of the film's subject matter and a statement concerning the total footage and the time required for projection and commentary.

Members of the American Ornithologists' Union will mourn the passing of Dr. Albert Kenrick Fisher, one of the two remaining Founders of the organization, who died in Washington, D. C. on June 12, this year.

Notice has also been received of the death of Dr. Aldo Starker Leopold at Baraboo, Wisconsin, on April 21, and of that of Mr. William C. Adams at Albany, New York, on June 12.

RECENT LITERATURE

Bird display and behavior.[1]—Some years ago (1942) Mr. Armstrong published an excellent volume entitled Bird Display (see review in The Auk, 60: 287–288, April, 1943). The present work is a revised and enlarged edition of that book. There has been considerable research and publication on the subject in the intervening years, and, in incorporating the various discoveries and theories in the text, Mr. Armstrong has needed to rewrite a considerable part of the earlier work interpolating on occasion and making several additional chapters from some of the expanded material.

As before, opposing theories are stated and documented and general propositions are given with the various exceptions thereto. The author thus presents a broad summary of what is known and thought of the multitudinous activities that make up a bird's world. He emphasizes the growing realization, too, that the behavior of birds is as integral a part of their makeup as is their anatomy, and their patterns of behavior need to be taken into consideration by taxonomists whenever the data become available as valuable clues to relationships. Unfortunately, as regards a vast number of the birds of distant regions, these data are too fragmentary at present to be of the fullest help, but they are increasing and will certainly lead to important discoveries in systematics.

It is in their own right, however, that the display and other behavior of birds are discussed here, as is evidenced by the thirty-eight pages of bibliography given at the close of the text, more complete than in the preceding volume. The literature on the subject is extensive, and to read all of it in the original would be a task that would require more time than most busy people have to devote to it, unless they have kept abreast of it through the years. The best alternative is a good review of the general topic with a bibliography of the many original references cited in the text to which the interested reader may go for fuller discussions when he so desires. This Mr. Alexander has given us and his volume thus constitutes not only a book that will repay reading for itself but that gives a guide for further study. It should be on every ornithological bookshelf.—J. T. Zimmer.

Australian bird life.[2]—In this little book, Mr. Barrett has recounted interesting facts concerning many of Australia's interesting birds. Although first printed in 1945, the volume has not been reviewed in The Auk and deserves mention at this new appearance. It is not a handbook for the identification of species and does not give descriptions of the birds, themselves, but instead presents a running account of the members of the various families, their characteristic behavior, songs, nests and eggs, distribution, and other such details. Some of the account is general, but in the main the author has selected representative species (and a goodly number of them) and treated them, one after the other, adding many anecdotes from personal observations or recorded statements.

The reader may gain here a good view of the bird life of the Australian countryside, although if he is unfamiliar with the local species he will need to supplement his reading with a descriptive manual the better to visualize the birds about which Mr. Barrett is writing. A great deal of interesting information is condensed in the pages.—J. T. Zimmer.

---

[1] Armstrong, Edward A. 'Bird display and behaviour. An introduction to the study of bird psychology.' 8vo, pp. 1–431, frontisp. (col.), pls. I-XXXII, figs. 1–30, 1947. Lindsay Drummond Limited, London. Price, 21 s.

[2] Barrett, Charles. 'Australian bird life.' Crown 8vo, pp. 1–239. 38 pls. (7 col.), March 4, 1948. Oxford University Press (Printed in Australia). Price, $3.25.

Batrachian music.[1]—The calls of many of the eastern frogs and toads have been transferred to four double-sided records for the phonograph in the manner followed earlier in the 'American Bird Songs' prepared by the same Foundation (*see* review in The Auk, 60: 288, April, 1943). Although not primarily ornithological, of course, these records are certain to be of interest to nature-lovers in general, many of whom must have wished to become familiar with the sounds of animals other than birds. It may be noted, incidentally, that a few bird voices have crept into these recordings, perhaps were purposely left there since the records are remarkably free from disturbing background noises. Some of the batrachian voices are, however, so powerful that other sounds accompanying them might not in any case be too intrusive!

The inside of the cover of the album contains a list of the species found on each record and the records, themselves, are individually labeled, while the well-known voice of Dr. Arthur A. Allen introduces each performer in turn. The album is thoroughly recommended to everyone interested in the sounds of nature.—J. T. Zimmer.

The Ruffed Grouse.[2]—This fine report is the product of sixteen years of research; the work was initiated in 1930 when there was still much to be learned of practical methods of approach to the problems, but, as it developed, new lines of study were suggested and it expanded into the broad research project of which this volume is the final report.

From early times there have been alternating periods of abundance and scarcity steadily trending toward a definite decrease in grouse population, and this condition was the underlying reason for the investigation here recorded. It was realized that before adequate measures could be recommended for bringing back these birds the causes of their deterioration must be studied in detail. Not that supposed causes had not been postulated in times past; some 25 of these suggestions that have been given by two or more of 59 different writers from 1754 to 1933 are tabulated and show the interest which the problem has consistently aroused.

In any case, these and other possible factors have been critically examined. As a fundamental basis, the characteristics of the species were studied in detail—the anatomy, plumage, physiology, growth, general behavior, cover requirements and preferences, food and feeding habits, breeding behavior, reproductive capacity, enemies, diseases and parasites, influences of man, attempts at artificial propagation, restocking of land—all these and more received their share of attention. At the end it was possible to draw authoritative conclusions and suggest methods for making the best of the situation. Briefly, it was found that the fluctuations in numbers could not be ascribed to any single cause but to a multiplicity of factors, some of which appear to be in effect somewhere every year. When the local "low" periods have synchronized over a sufficiently wide area, the general effect has been marked and has produced a major decline.

The practical answer appears to be the proper management of land to give the birds the best possible conditions under which they can live and rear their young naturally—in other words, modern conservation in the real sense of the word. Without it other methods are likely to be futile.

---

[1] 'Voices of the night.' The calls of 26 frogs and toads found in eastern North America. Recorded by the Albert R. Brand Bird Song Foundation, Cornell University.' Comstock Publishing Co. Ithaca, N. Y. Price, $6.50.

[2] Bump, Gardiner; Darrow, Robert W.; Edminster, Frank C.; Crissey, Walter F. 'The Ruffed Grouse. Life history—propagation—management.' 4to, pp. XXXVI + 915, 4 pls. (col.), figs. 1–94, 122–168, 170–171, tables 1–186, 127 sketches, 1947. New York State Conservation Department, Albany, N. Y. Price, $10.00.

There are numerous contributing authors who had a share in the production of this report, properly accredited in place though not listed on the title-page. There is also a very extensive group of collaborators whose assistance undoubtedly helped to make the study a success. To all who had a share in the work thanks are due from all persons interested in the Ruffed Grouse. Its future, we hope, is made more secure as a result of this fine study.—J. T. ZIMMER.

Birds of Tranninh, Laos.[1]—M. André David-Beaulieu, a Civil Service official of French Indochina, has spent some twenty-five years in that country. He is an enthusiastic ornithologist and a most energetic and successful collector who has taken every opportunity of studying the avifauna of the districts where he has been stationed. Excellent accounts of the birds of the various parts of Cochinchina and Annam have been published by him from time to time in L'Oiseau. From 1937 to 1943 he was the Resident of Kieng-Khouang, the chief town of the Tranninh Province of Northern Laos, a highland particularly rich in its bird life. This area had first been explored in 1923 by P. Jabouille, W. P. Lowe, and the writer of these lines who visited it again in 1938–1939, this time in the company of J. C. Greenway and F. Edmond-Blanc, when David-Beaulieu welcomed and assisted us greatly. During his first term of over five years he had collected over 6000 specimens of 505 species and subspecies. This fine collection, however, was completely and wilfully destroyed in 1945 by the Annamite rebels, who showed infinite patience in pulling to pieces every specimen, as well as every book and register—an irreparable loss to their owner and to science. Fortunately, David-Beaulieu had written an annotated list which was published at Hanoi in 1944, so that a record of this work in the full remains. But just a few copies of this report have been saved after the disorders of the last few years in Tonkin. One of these copies has recently reached us. Only a resident ornithologist can make a good study of the birds of a given district. The present study is of very special interest because it is full of first-hand observations. It is a true mine of information on the life habits and movements of many species of which we still knew very little. Most important are the lists of the species and subspecies arranged according to the season when they are found in the area. Since the book is unlikely to be available to many workers, I have summarized some of the more important data.

1. RESIDENT BIRDS, which may not all breed there but specimens of which have been met with throughout the year. Those which were found nesting are indicated; among the most interesting records are those of *Tringa ochropus* and *T. hypoleucos* occurring at all seasons; *Halcyon pileata*, a common breeder as also *Erythrina e. murati* and *Carduelis ambiguus;* of *Aethopyga gouldiae harrietae* as a sedentary sunbird.

2. RESIDENT BIRDS WHOSE NUMBERS INCREASE AT A GIVEN SEASON: *Ixobrychus cinnamomeus* (summer); *Amaurornis phaenicura* (spring); *Zoothera dauma* and *Z. aurea* (winter, both nesting on the mountains); *Myophoneus coeruleus* and *M. eugenei* (winter) and *Phylloscopus fuscatus* (winter), *P. inornatus* (autumn and winter), *P. proregulus* (winter); *Motacilla cinerea* (winter).

3. BREEDING SUMMER VISITORS: *Dendrocygna javanica, Rallus striatus, Amaurornis fusca; Cacomantis merulinus, C. sonnerati, Clamator coromandus, Apus affinis, Terpsiphone paradisi, Dicaeum modestum* (*agile*), *Mycerobas melanozanthos, Oriolus chinensis.*

4. WINTERING BIRDS, among which the most interesting records are those of *Rallus aquaticus, Amaurornis bicolor, Gallinula chloropus, Muscicapa strophiata,*

[1] DAVID-BEAULIEU, A. 'Les Oiseaux du Tranninh.' 4to, pp. 1–225. 1944. Imprimerie d'Extrême Orient, Publication de l'Ecole Supérieure des Sciences, Université Indochinoise, Hanoi.

M. concreta, M. hyperythra, M. vivida, M. thalassina, Seicercus superciliaris, Phylloscopus ricketti, Dicaeum chrysorrheum.

5. BIRDS PASSING IN THE SPRING ONLY: *Glareola maldivarum, Pluvialis apricarius, Porzana pusilla, Cuculus canorus, Prinia flaviventris.*

6. BIRDS PASSING IN THE AUTUMN ONLY: *Egretta garzetta, Nycticorax nycticorax, Butorides st. javanicus, Dupetor flavicollis, Tringa glareola, Capella gallinago, C. stenura, Streptopelia tranquebarica, Tyto alba, Locustella certhiola, Sturnia sinensis.*

7. BIRDS PASSING IN SPRING AND AUTUMN: *Bubulcus ibis, Ardeola bacchus, Gallicrex cinerea, Muscicapa hainana, M. banyumas, M. zanthopygia, M. latirostris, Acrocephalus stentoreus, A. bistrigiceps, Locustella lanceolata, Phylloscopus borealis, P. coronatus, Dicrurus macrocercus, Motacilla flava, M. indica, Anthus cervinus, Mirafra javanica, Emberiza aureola.*

8. BIRDS OCCURRING CASUALLY OR INSUFFICIENTLY KNOWN:

The importance of recording birds' movements in such a little-known part of the world can hardly be over-emphasized. The book is full of interesting notes on many species, but we can only point out a few, such as a record of *Rheinartia ocellata* which extends the range of the species for a hundred miles to the northwest; the description of *Chaetura caudacuta bourreti* (p. 89), a bird occurring at all seasons, which seems to be very near, if not identical with, the migrating *C. c. caudacuta;* and that of *Saxicola torquata delacouri* (p. 106). This is a puzzling bird, the type and unique specimen of which has been lost. It is smaller and more slender than *S. t. stejnegeri*, the common winter visitor of the district, with deep black upper parts, chin and throat (without any white on the sides of the neck), the feathers having faint dark brown borders; breast and abdomen dark reddish brown, the hidden part of the feathers black; rump and upper tail-coverts white slightly streaked with reddish buff; thighs and under tail-coverts white; primaries and secondaries dark brown narrowly edged with reddish; tertiaries deep black more broadly edged with reddish, the last ones with whitish; tail black. The type was found at Xieng Khouang, Nov. 26, 1942; wing: 67; tail: 47; tarsus: 18; culmen: 8 mm. It does not seem that this bird can belong to the species *Saxicola torquata*, and this description does not apply to any other known species or subspecies.

In a long introduction of 41 pages, with map, the author draws an excellent picture of the Tranninh country, which consists of 4,000–5,000-foot plateaus, cut and surrounded by mountains reaching nearly 10,000 feet, with a few lower valleys and small plains, some as low as 1,000 feet. Information on the history, geography, climate, ethnography, cultivation, industries, archeology, biotops and the general fauna are supplied, as well as a list of the localities where collections were gathered.

The general survey of the Indochinese avifauna conducted by the late Pierre Jabouille and the present writer since 1923 has resulted in a greatly increased interest in the birds of the country and in stimulating the work of local naturalists who since have made notable contributions to science. Among them, André David-Beaulieu and Pierre Engelbach are the two best ornithologists who have lived in Indochina during the last thirty years, and their prolonged researches on the terrain have very happily completed the pioneer work that we had undertaken. The present study is of exceptional value in the field of Indochinese ornithology.—JEAN DELACOUR.

New England birds.[1]—The island of Nantucket, although sporadically visited by naturalists and sportsmen for many years, has not previously been given a thorough investigation ornithologically speaking, and even yet it appears that much

[1] GRISCOM, LUDLOW, AND FOLGER, EDITH V. 'The birds of Nantucket.' 8vo, 5 pr. ll., pp. 1–156, 17 pls., 1 map, March 11, 1948. Harvard University Press, Cambridge. Price, $3.25.

remains to be done before the status of all the birds that reach the island is clarified. The need, it seems, is for continuous investigations over a period of years rather than the relatively broken observations of the past, some of which may be misleading. Owing to the insular position of the area, it is on the regular migration route of some land birds, but apparently not of others, although these may be common on the mainland. Migration dates need to be correlated with mainland dates and flight lines determined. Details such as these can not be determined from a few casual records, and they invite study. Changes in the forestation of Nantucket through the years have produced obvious changes in the bird life. Various species once common are now rare and vice versa. These are worth continued investigation. The problems are outlined in the general survey that introduces the present work.

The authors have brought together the available information from past records and personal observations and have listed 274 forms that have been found on Nantucket and some of the adjacent islands and shoals. They give the local status of each and the inclusive dates of occurrence, as far as known, or the individual dates for the rarer birds. Further discussions are frequently added to amplify the bare facts.

A glance through the pages shows a surprising number of "casual," "vagrant," and "rare" or "very rare" species and of forms whose status has undergone various alterations, thus giving emphasis to the authors' introductory statement of the need for further work. Certainly there is here a fertile field open for future workers, and Mr. Griscom and Miss Folger have clearly pointed the way and shown what remains to be done.—J. T. Zimmer.

A bibliography of the ducks.[1]—A copy of this rare book has come into my hands through the interest and kindness of Dr. Oliver L. Austin, Jr. The present work begins with 1925 when Dr. Phillips's bibliography ends and continues through 1940, but goes back as far as 1849 so as to include the geese and swans which Dr. Phillips admittedly did not include, and it also contains numerous references to papers in Japanese which were not mentioned in the Phillips bibliography. The extent of Dr. Kuroda's undertaking may be gauged by the fact that it contains 6539 separate items of which 2152 were published prior to 1926, the balance from 1926–1940. Each entry is briefly annotated to show the species referred to if the title does not contain such information. The arrangement is chronological; the authors, alphabetically by years; but any species reference is obtainable through the very comprehensive index occupying the last 32 pages of the volume. In using the index it must be realized that the figures refer not to the bold-face *number* preceding each entry in the text but to the *page* on which the species is mentioned. The book is well printed and all citations are in proper form, but it is to be regretted that a better quality of paper was not used for this very important and competently compiled bibliographic contribution to the literature of the Anatidae.—J. L. Peters.

Pennsylvania-German bird lore.[2]—The experiences with birds possible to a Pennsylvania farmer are written of simply but feelingly in a chapter entitled 'Birds and the Common Life,' which ends by saying: "Birds had a place in that life of greater import and wider significance than most of us have so far been able to imagine."

[1] A bibliography of the Duck Tribe, / Anatidae, mostly from 1926 to 1940, exclu / sive of that of Dr. Phillips's Work. / Edited by / Marquis Nagamichi Kuroda, D.Sc. / [vignette] / Published by the Herald Press / Tokyo / October, 1942. Pp. [i–VI] + 852.

[2] Rupp, William J. 'Bird names and bird lore among the Pennsylvania Germans.' The Pennsylvania German Society Proceedings and Addresses, 52: xi + 337 pp., illus., 1946. (Thomas R. Brendle, Sec'y., Egypt, Lehigh Co., Pa.) Price $5.00.

In a section on 'Birds in Colonial America,' the author quotes or translates passages on birds from literature pertinent to his field and usefully identifies the species mentioned. His treatment of the Pennsylvania-German names, the heart of the work, is very full, collecting a high proportion of the total known information. The derivation, meaning, and often the history of the names are set forth. Beliefs, superstitions, and sayings about birds are collected and discussed, and excerpts are grouped to illustrate references in song and story to bird calls, sport and games based on birds, and popular appreciation of birds. The quotations are chiefly in Pennsylvania-German and the illustrations are mostly reproductions of woodcuts from school texts and other books of early times. The book is a compendium of its subject with which there is no work to compare for any other state nor, so far as I know, for an other country.—W. L. McAtee.

Nebraska bird notes.[1]—This little book has been long in the making and has an interesting history. The author's local bird observations began forty years ago, although the idea of the book developed much later. When the idea crystallized, Mr. Tout began organizing his notes for the purpose. Being editor of the weekly county paper, he established a column in which the account of one species was printed in each issue. The type was then saved until sufficient material was on hand to make one signature and after printing, the type was distributed. When all the signatures were thus on hand, the book was put together. It is thus a very personal production in more than one respect.

Lincoln County lies in the sandhill country embracing the fork of the Platte River on the old migration routes of the Whooping Crane and the Trumpeter Swan, and, like various parts of Nebraska, has an inteersting mixture of eastern and western species. While its bird life is naturally less extensive than that of more varied terrain may be, Mr. Tout has recorded over two hundred and eighty species and subspecies, including birds found or reported by others as well as those personally observed. The list is thus as complete as could be made. Dates of regular or casual occurrence are given and personal observations extracted from the author's notebook or the circumstances surrounding various unusual records are recounted. The book is thus more than a check-list of the birds of the region as it is more than a simple personal record. The author has produced an interesting volume and has laid a good foundation for future chroniclers or for his own subsequent reports.—J. T. Zimmer.

Periodical Literature

Adams, R. G. Oyster-catcher washing worms. Brit. Birds, **40** (12): 376-377, Dec. 1, 1947.

Aldrich, John W. Distribution of North American birds. The breeding distribution of the Dickcissel. Aud. Field Notes, **2** (1): 12–13, 1 map, Jan., 1948.

Allen, Robert P. Lost: part of a continent. Aud. Mag., **50** (1) sect. 1: 28–35, 6 figs., 1 map, Jan.–Feb., 1948.—Whooping Cranes.

Allen, Robert P. Man and the lesser animals. Aud. Mag., **50** (2): 96–99, 5 figs., Mar.–Apr., 1948.

Andrews Henry E. Behaviour of heron with large fish. Brit. Birds, **41** (1): 24, Jan., 1948.

Antevs, Ada. Behavior of the Gila Woodpecker, Ruby-crowned Kinglet, and Broad-tailed Hummingbird. Condor, **50** (2): 91–92, Mar. 16, 1948.

[1] Tout, Wilson. 'Lincoln County birds. Lincoln County, Nebraska.' 8vo, 4 pr. ll., pp. 1–191, frontisp., 2 figs., 1947. Published by the author, North Platte, Nebr.

ARMSTRONG, EDWARD A. Bird display. Animal Kingdom, **51** (2): 52–56, 59, 3 figs., Apr. 1, 1948.

[AUTHOR?] A list of foreign birds preserved in the collection of Prince Taka-Tsukasa, Marquess Yamashina, Marquess Hachisuka and Marquess Kuroda, pt. V. Tori, **11**, (53–54): 449–462, Dec., 1942.—Accipitres and Striges. *Id.*, pt. VI, Tori, **11**, (55): 651–667, Sept., 1944.—Psittaci.

BAGGALEY, WILLIAM. Behaviour of Mute Swan. Brit. Birds, **41** (1): 25, Jan., 1948.

BAKER, ROLLIN H. Report on collections of birds made by United States Naval Medical Research Unit No. 2 in the Pacific war area. Smiths. Misc. Collect., **107** (15): 1–74, pls. 1–6, figs. 1–9, Mar. 22, 1948.

BAKER, WILLIAM C. A sight record of the Sycamore Warbler in eastern Ohio. Ruffed Grouse, **2**: 24–26, 1948.

BARLOW, H. Exceptional feeding behaviour of Kingfisher. Brit. Birds, **41** (3): 86, Mar. 1, 1948.

BATCHELOR, I. R. C. Red Grouse drinking. Brit. Birds, **41** (2): 60, Feb., 1948.

BEEBE, WILLIAM. Avian migration at Rancho Grande in north-central Venezuela. Zoologica, **32** (4): 153–168, pl. 1, fig. 1, Dec. 29, 1947.

BEHLE, WILLIAM H. Systematic comment on some geographically variable birds occurring in Utah. Condor, **50** (2): 71–80, Mar. 16, 1948.

BENNETT, A. G. Birds seen in the Atlantic Ocean between 50° N. and 52° S. Ibis, **90**: 143–145, fig. 1, Jan. 26, 1948.

BENNISON, B. E., AND COATNEY, G. ROBERT. The sex of the host as a factor in *Plasmodium gallinaceum* infections in young chicks. Science, **107** (2771): 147–148, fig. 1, Feb. 6, 1948.

BENSON, C. W. Geographical voice-variation in African birds. Ibis, **90**: 48–71, Jan. 26, 1948.

BENSON, C. W. Observations from the Kota-kota district of Nyasaland. Ibis, **89**: 553–566, Dec. 10, 1947.

BERGER, A. J. Early nesting and Cowbird parasitism of the Goldfinch in Michigan. Wils. Bull., **60** (1): 52–53, Mar., 1948.

BERLIOZ, J. Une race nouvelle de canard d'Afrique occidentale. Oiseau, **17** (1): 88–93, 3 figs., 1947.

BLANCHET, MAURICE. Oiseaux de Rome. Nos Oiseaux, **19** (196): 173–176, Feb., 1948.

BLOESCH, MAX. Die Störche in der Schweiz. Orn. Beob., **45** (1): 5–7, 1 fig., Feb., 1948.

BOEHM, ERHARD F. Australian birds on animate perches. Emu, **47** (3): 233–234, Jan. 28, 1948.

BOEHM, E. F. Crows and blowflies. So. Austral. Nat., **24** (1): 11, Sept. 2, 1946.

BOLLVIK, RUNE. Lilla sumphönan (*Porzana parva*) hörd i Uppland. Vår Fågelvärld, **6** (3–4): 145–148, 1947.

BOND, R. M. Returns of banded California Brown Pelicans. Condor, **50** (2): 89, Mar. 16, 1948.

BORROMEO, GIAN CARLO. Riproduzione in gabbia di due tordi (*Turdus ericetorum philomelos*, Brehm). Riv. Ital. Orn., **18** (1): 51–52, Jan., 1948.

BOS, G. *Puffinus kuhlii borealis* Cory, een nieuwe vogel voor Nederland. Limosa, **20** (4): 230–231, 2 figs., Dec., 1947.

BOS, G. *Puffinus kuhlii borealis* Cory, een nieuwe vogel voor Nederland. Ardea, **35** (3–4): 240–241, pl. 2, Dec., 1947.

BOURLIÈRE, F. Les variations pigmentaires du *Tangara chilensis*. Oiseau, **17** (1): 1–3, 1 plate (col.), 1947.

BRADFORD, ALFRED S. Some notes on the Ruffed Grouse. Pass. Pigeon, 9 (4): 130–131, Oct., 1947.

BRADLE, B. J. Grouse management research project 13-R. Wis. Wildl. Research Quart. Progr. Rep., 6 (3): 89–94, Oct., 1947.

BRANDOLINI, ALFREDO. Nidificazione di *Glareola pratincola* (L.) in Romagna. Riv. Ital. Orn., 18 (1): 13–17, figs. 1–2, Jan., 1948.

BRANDOLINI, ALFREDO, AND ZANGHERI, PIETRO. Ancora sulle presunte catture di *Hirundapus caudacuta caudacuta* (Latham) nel Ravennate. Riv. Ital. Orn., 18 (1): 50–51, Jan., 1948.

BRECHER, LEONARD C. Bronzed Grackles feeding on beech nuts. Kentucky Warbler, 24 (1): 7–9, Jan., 1948.

BRONGERSMA, L. D. Note on *Oceanites oceanicus* (Kuhl) in the Gulf of Aden. Ardea, 35 (3–4): 225–226, Dec., 1947.

BROUWER, G. A. Een Alpengierzwaluw, *Apus melba* (L.), in de vorige eeuw in Nederland aangetroffen. Ardea, 35 (3–4): 236–240, Dec., 1947.

BROWN, PHILIP E., AND LYNN-ALLEN, ESMOND. The breeding of Avocets in England in 1947. Brit. Birds, 41 (1): 14–17, pls. 1–3, Jan., 1948.

BROWN, R. H.; COOMBES, R. A. H.; AND RYVES, B. H. Nesting season of Common Buzzard. Brit. Birds, 41 (2): 53–54, Feb., 1948.

BRYSON, DEREK K. Large gathering of Ravens during breeding season. Brit. Birds, 41 (1): 19, Jan., 1948.

BULL, P. C. Field notes on waders in the southwest Pacific with special reference to the Russell Islands. Emu, 47 (3): 165–176, 1 map, Jan. 28, 1948.

BURCKHARDT, DIETER. Zur Brutbiologie der Beutelmeise, *Remiz pendulinus* (L.). Orn. Beob., 45 (1): 7–31, figs. 1–14, Feb., 1948.

BURCKHARDT, D., AND WYSS, H. Berichtigung zum Sammelbericht über die Brutperiode von 1947. Orn. Beob., 45 (1): 32, Feb., 1948.

BURROWS, W. M. Mating of Pied Stilt. New Zeal. Bird Notes, 2 (7): 149, Jan., 1948.

BUSS, IRVEN O. Dunn County quail research project 2-R. Wis. Wildl. Research Quart. Progr. Rep., 6 (3): 1–6, Oct., 1947.

BUTT, DAVID V., AND VINE, ANTHONY E. Unusual nest-site of Stock-Dove. Brit. Birds, 41 (3): 89, Mar. 1, 1948.

BUXTON, E. J. M., AND KEIGHLEY, J. Sex distinctions in Oyster-Catcher. Brit. Birds, 41 (3): 91–92, Mar. 1, 1948.

CAWKELL, E. M. Carrion Crows attacking Magpie. Brit. Birds, 41 (3): 83, Mar. 1, 1948.

CHAMBERLAIN, F. W. Chaffinch building second nest before fledging of first brood. Brit. Birds, 41 (3): 83–84, Mar. 1, 1948.

CHAMBERS, AMY. Minnesota nesting records, 1947. Flicker, 19 (4): 90–95, Dec., 1947.

CHAPPELL, BERTRAM. The dissimilar egg and other problems. Part 3 (cont.). Oologists' Rec., 22 (1): 1–8, Mar., 1948.

CHASEN, F. N. Bibliography of publication on birds and mammals. Bull. Raffles Mus., 18: 171–176, Oct., 1947.

CHENG, TSO-HSIN. List of scientific publications. Fukien Christian Univ.: 35–39.

CHISHOLM, A. H. Some birds of central Victoria. Emu, 47 (3): 203–205, pl. 17, Jan. 28, 1948.

CHRISTIANSEN, ARTHUR. Sortgraa Ryle (*Calidris maritima* (Brünn.)) ynglende i Härjedalen. Dansk Orn. Foren. Tidsskr., 41 (2): 121–124, pl. 3, fig. 1, July, 1947.—With summary in English.

CLANCEY, P. A. Notes on birds of the western palaearctic region. Nos. 5–8. Ibis, 89: 652–654, Dec. 10, 1947.

CLANCEY, P. A. Notes on birds of the western palaearctic region. No. 9. Ibis, 90: 132–134, Jan. 26, 1948.

CLANCEY, P. A. The races of *Turdus ericetorum* indigenous to the British Isles. Ibis, 90: 112–115, Jan. 26, 1948.

CLARK, V. I.; ROBERTS, T. M.; AND FLEMING, C. A. Contributions to the Gannet census. New Zeal. Bird Notes, 2 (7): 152–154, Jan., 1948.

CLAY, THERESA. Relationships within the Sterninae as indicated by their mallophagan parasites. Ibis, 90: 141–142, Jan. 26, 1948.

CLAY, THERESA. The systematic position of the Musophagi as indicated by their mallophagan parasites. Ibis, 89: 654–656, Dec. 10, 1947.

COGSWELL, HOWARD L. Summer observations of birds on Okinawa, Ryukyu Islands. Condor, 50 (1): 16–25, figs. 4–6, Jan. 20, 1948.

COMMON, R. H.; RUTLEDGE, W. A.; AND HALE, R. W. Gonadal hormones and mineral balance in the domestic fowl. Nature, 160 (4068): 541–542, Oct. 18, 1947.

CONDON, H. T. South Australian birds. 1. Water birds. So. Austral. Nat., 24 (1): 1–9, 22 figs., Sept. 2, 1946.

CONDON, H. T. The birds of the Northern Territory. Part 2. So. Austral. Nat., 23 (1): 2–10, 14 figs., 1 map, Mar. 31, 1945.

COOKE, R. Bird life on the Pett Level floods, 1941–1943 (cont.). Brit. Birds, 41 (3): 66–70, Mar. 1, 1948.

COOMANS DE RUITER, L. Roofvogelwaarnemingen in Zuid-Celebes. Limosa, 20 (4): 213–229, Dec., 1947.

COOMBES, R. A. H. On the races of the Bean Goose in the Netherlands. Limosa, 20 (4): 229–230, Dec., 1947.

COOPER, H. M., AND CONDON, H. T. On some fragments of Emu egg-shell from an ancient camp-site on Kangaroo Island. So. Austral. Orn., 18 (7): 66–68, fig. 1, Jan. 9, 1948.

CORREA FILHO, VIRGILIO. E. Goeldi. Rev. Brasil. Geogr., 8 (1): 129–130, 1 pl., Jan.–Mar., 1946.—Biographical sketch.

COTT, HUGH B. Edibility of the eggs of birds. Nature, 161 (4079): 8–11, figs. 1–2, Jan. 3, 1948.

COTT, HUGH B. The edibility of birds: illustrated by five years' experiments and observations (1941–1946) on the food preferences of the hornet, cat and man; and considered with special reference to the theories of adaptive coloration. Proc. Zool. Soc. London, 116: 371–524, pls. 1–6, figs. 1–38, Febr., 1947.

CRISTINA, PIETRO. Osservazioni sui colibrì o uccelli mosca. Riv. Ital. Orn., 18 (1): 1–12, figs. 1–4, Jan., 1948.

CROUCH, J. R., CRAVENS, W. W., ELVEHJEM, C. A., AND HALPIN, J. G. Relation of biotin to congenital deformities in the chick. Anat. Rec., 100 (1): 29–48, 9 figs., Jan., 1948.

CULLEN, J. M. Male Pied Wagtail building nest. Brit. Birds, 40 (12): 374, Dec. 1, 1947.

CUNNINGHAM, JOHN M., AND WODZICKI, KAZIMIERZ, A. Notes on the bird life of the Porangahau district, N. Z. Emu, 47 (3): 177–198, pls. 12–15, Jan. 28, 1948.

DA COSTA NOVAES, FERNANDO. Notes sôbre os conopophagidae do museu nacionae (Passeriformes, Aves). Summa Brasil. Biol., 1 (13): 243–250, July, 1947.

DAL NERO, VITTORIO. La comparsa del Gruccione nel Veronese. Riv. Ital. Orn., 18 (1): 54–55, Jan., 1948.

DANSEREAU, PIERRE. Os planos da biogeografia. Rev. Brasil. Geogr., **8** (2): 189–210, figs. 1–7, Apr.–June, 1946.—With summary in various languages.

DAVIDSON, A. F. Bird life of West Jutland. Field, **191** (4958): 75, 5 photos., Jan. 17, 1948.

DAVIS, DORLAND J. Susceptibility of the English Sparrow (*Passer domesticus*) to infection with psittacosis virus of pigeon origin. Proc. Soc. Exp. Biol. and Med., **66** (1): 77–79, Oct., 1947.

DAVIS, EARLE ANDREW, JR. An ecological study of birds at Pymatuning refuge. Ruffed Grouse, **2**: 35–52, fig. 1, 1948.—Abstract by George B. Thorp.

DAVIS, T. F., AND JOHNSTON, DAVID W. Summer occurrence of the Black Duck in Georgia. Oriole, **12** (4): 47, Oct., 1947.

DAWSON, WILLIAM R. Records of fringillids from the pleistocene of Rancho La Brea. Condor, **50** (2): 57–63, fig. 16, Mar. 16, 1948.—*Pipilo angelensis*, new species.

DE BEAUFORT, L. F. Notes on the behaviour of a Slender-billed Nutcracker. Ardea, **35** (3–4): 226–230, Dec., 1947.

DE BONT, A. F. Changements de la faune ornithologique de la Campine turnhoutoise. Gerfaut, **37** (4): 172–187, 3 figs., 1947.

DECKER, ANNABELLE, AND MCGINNIS, JAMES. Black pigmentation in feathers of Buff Orpington chicks caused by vitamin D deficiency. Proc. Soc. Exp. Biol. and Med., **66** (1): 224–226, 1 fig., Oct., 1947.

DEELDER, C. L. Een waarneming betreffende Bijeneters, *Merops apiaster* L., in Nederland. Ardea, **35** (3–4): 249–251, Dec., 1947.

DE GRAAF, C. De avondvluchten van de Gierzwaluw, *Apus a. apus* (L.) Ardea, **35** (3–4): 157–183, Dec., 1947.

DE GRAAF, C. Melanistische Kokmeeuw, *Larus ridibundus* L. Ardea, **35** (3–4): 247–248, 1 fig., Dec., 1947.

DEHNEL, PAUL A. Winter occurrence of the Harlequin Duck in the Sacramento Valley. Condor, **50** (2): 91, Mar. 16, 1948.

DEIGHAN, H. G. A miscellany of new birds from eastern Asia. Proc. Biol. Soc. wash., **61** (2): 13–16, Mar. 4, 1948.—*Tephrodornis gularis jugans* (Doi Langka = Khao Pha Cho, northwestern Siam), *Tephrodornis pondiceriana orientis* (Krongpha, Phanrang Province, southern Annam), *Chloropsis aurifrons incompta* (southern slopes of the Lang Bian Plateau between Dalat and Ban Methuot Province, Haut-Donai Province, southern Annam), *Heterophasia annectens mixta* (Doi Pha Hom Pok, Siam-Southern Shan boundary), *Heterophasia capistrata tecta* (Nguluko (a settlement at elev. 10,000 ft. in the mountains just north of Likiang), northwestern Yunnan Province, China, *Passer rutilans ignoratus* (Mount Omei, Szechwan Province, China), new subspecies.

DEIGNAN, H. G. Races of the bulbul *Microscelis charlottae* (Finsch) and its relatives. Proc. Biol. Soc. Wash., **61** (1): 1–12, March 4, 1948.—*Microscelis viridescens cacharensis* ("Chutla Bhil," Cachar District, Surma Valley and Hill Division, Assam Province, India), *Microscelis viridescens myitkyinensis* (Myitkyina District, Sagaing Division, Burma), *Microscelis charlottae aquilonis* (Backan, northeastern Tongking), *Microscelis charlottae simulator* (Ban Hup Bon, Rayong Province, southeastern Siam), *Microscelis charlottae innectens* (Trangbom, Bienhoa Province, Cochinchine), new subspecies.

DEIGNAN, H. G. The races of the Black-throated Sunbird, *Aethopyga saturata* (Hodgson). Jour. Wash. Acad. Sci., **38** (1): 21–23, Jan. 15, 1948.

DELACOUR, JEAN. The Scarlet Cock-of-the-Rock. Avic. Mag., 54 (1): 1–2, 1 pl. (col.), Jan.–Feb., 1948.

DELACOUR, JEAN. Waterfowl at Clères in 1947. Avic. Mag., 53 (6): 189–199, Nov–Dec., 1947.

DELACOUR, JEAN. Waterfowl notes from the western United States. Avic. Mag., 53 (6): 215–217, Nov–Dec., 1947.

DE LAVELEYE, RENAUD. Moeurs sexuelles et sociales des Canards Colverts et de quelques autres Anatides. Gerfaut, 37 (3): 116–139, 1947.

DE MAERSCHALCK, J. Complément aux notes sur le Cincle Plongeur. Gerfaut, 37 (3): 142, 1947.

DEMENTIEV, GEORGES P. Révision systematique des faucons sacres *Falco cherrug* Gray. Oiseau, 17 (1): 9–22, 1947.

DEMENTIEV, G. P.; SPANGENBERG, E. P.; AND RUSTAMOV, A. K. The birds of Karabil, south-east Russian Turkestan. Ibis, 89: 615–623, Dec. 10, 1947.

DEMPSTER, EVERETT R., AND LERNER, I. MICHAEL. The optimum structure of breeding flocks. 1. Rate of genetic improvement under different breeding plans. Genetics, 32 (6): 555–566, Nov., 1947.

DENNIS, JOHN V. Wings over China. III (cont.). Bull. Mass. Aud. Soc., 32 (1): 9–14, 2 figs., Feb., 1948.

DENNIS, JOHN V. Wings over China. (cont.). Bull. Mass. Aud. Soc., 32 (3): 99–103, 2 figs., Apr., 1948.

DERSCHEID, JEAN MARIE. The Goldeneye in captivity (*Bucephala clangula* (L)). Avic. Mag., 53 (6): 217–223, 1 fig., Nov–Dec., 1947.

DE SCHAUENSEE, RODOLPHE MEYER. Two new subspecies of birds from western Colombia. Not. Nat., 209: 1–4, Apr. 16, 1948.—*Campylorhynchus albo-brunneus aenigmaticus* (La Guayacana, near El Diviso, southwestern Nariño), *Chlorothraupis stolzmanni dugandi* (La Selva, west slope Andes, Caldas), new subspecies.

DE VRIES, TSJ. Gs. Oölogische en nidologische mededelingen 1947. Limosa, 20 (4): 245–247, Dec., 1947.

DORFMAN, RALPH I., ET AL. Studies on the bioassay of hormones—the assay of pregnant mare's serum chorionic gonadotrophin. Endocrinol., 42 (2): 93–97, Feb., 1948.

DORFMAN, RALPH I., ET AL. Studies on the bioassay of hormones—the comparative activity of estrogens by the oviduct response in chicks. Endocrinol., 42 (2): 98–101, Feb., 1948.

DORFMAN, RALPH I., ET AL. Studies on the bioassay of hormones—the comparative oviduct response of various breeds of chicks to stilbestrol. Endocrinol., 42 (2): 102–106, Feb., 1948.

DORST, J. Révision systématique du genre *Corvus*. Oiseau, 17 (1): 44–87, 1 fig., 1947.

DUPOND, CH., ET AL. Observations ornithologiques saisonnières et locales. Gerfaut, 37 (4): 149–172, 1947.

EAST, BEN. When the blues and snows go north. Nat. Hist., 57 (3): 132–136, 6 figs., Mar., 1948.

EDMONSON, T. Breeding of Garganey in Lancashire. Brit. Birds, 41 (2): 55, Feb., 1948.

EICHLER, WOLFDIETRICH. Schutzfärbung bei Federlingen. Voegel Heimat, 18 (6): 103–108, figs. 1–3, Mar., 1948.

EIGSTI, W. E. "Drumming" in the Chimney Swift. Nebr. Bird Rev., 15 (2): 9–11, figs. 1–3, Mar. 1948.

FALKNER, GUY. Notes on the Black-capped Social Weaver (*Pseudonigrita cabanisi*). Avic. Mag., **54** (1): 27–28, Jan.–Feb., 1948.

FAUTIN, REED W. Biotic communities of the northern desert shrub biome in western Utah. Ecol. Monogr., **16** (4): 253–310, fisg. 1–19, Oct., 1946.

FENINGER, OTTO. Contributo alla conoscenza dei ligamenti della testa di uccelli. Riv. Ital. Orn., **18** (1): 48–50, figs. 1–3, Jan., 1948.

FERDINAND, LORENZ. Studier af Fuglelivet paa Faerøerne. Dansk Orn. Forenings Tids., **41** (1): 1–37, 8 figs., May, 1947—With a summary in English.

FISHER, HARVEY I. Interbreeding of Laysan and Black-footed Albatrosses. Pacific. Sci., **2** (2): 132, Apr., 1948.

FISHER, HARVEY I. The question of avian introductions in Hawaii. Pac. Sci., **2** (1): 59–64, Jan., 1948.

FLEMING, C. A. Present distribution of N. Z. Robin. 2. New Zeal. Bird Notes, **2** (7): 150–151, 1 map, Jan., 1948.

FOOKS, H. A. Duck in India. Avic. Mag., **53** (6): 209–211, Nov.–Dec., 1947.

FOSCHI, FERRANTE. Appunti sui Chiurli. Riv. Ital. Orn., **18** (1): 55–56, Jan., 1948.

FOX, HELEN M. Some notes on the flowers and trees in Audubon's "Birds of America." Jour. N. Y. Botan. Garden, **47** (558): 144–152, 2 pls., June, 1946.

FOX, WADE. Horned Owl feeding on Garter Snake. Condor, **50** (1): 46, Jan. 20, 1948.

FRANK, WILLIAM JOHN. Ruffed Grouse drumming site counts. Jour. Wildl. Manage., **11** (4): 307–316, Oct., 1947.

GACOND, R. Un comportement rare du Vanneau mâle au nid. Nos Oiseaux, **19** (196): 181, Feb., 1948.

GÉROUDET, P. Chouettes et hiboux. Nos Oiseaux, **19** (196): 177–180, 5 figs., Feb., 1948.

GÉROUDET, P. Le Jaseur boréal en Suisse pendant l'hivér 1946–47. Orn. Beob., **45** (1): 1–5, Feb., 1948.

GÉROUDET, PAUL. Quelques notes sur la Harelde de Miguelon, *Clangula hyemalis* (L.). Nos Oiseaux, **19** (196): 165–172, 8 figs., Feb., 1948.

GIBB, JOHN. Report on the immigration of waxwings, winter 1946–7 (cont.). Brit. Birds, **41** (1): 2–9, 1 map, Jan., 1948.

GIBB, JOHN. Report on the immigration of waxwings, winter 1946–7 (concl.). Brit. Birds, **41** (2): 34–40, Feb., 1948.

GIBB, JOHN, AND TUCKER, B. W. The exceptional passage of Curlew-Sandpipers and Little Stints in the autumn of 1946. Brit. Birds, **40** (12): 354–359, Dec. 1, 1947.

GIBSON-HILL, C. A. Bird type specimens formerly in the Raffles Museum, Singapore. Ibis, **90**: 145–147, Jan. 26, 1948.

GIBSON-HILL, C. A. Common Sandpipers displaying in winter quarters. Brit. Birds, **41** (2): 57–58, Feb., 1948.

GIBSON-HILL, C. A. Notes on the birds of Christmas Island. Bull. Raffles Mus., **18**: 87–169, pls. 1–7, 5 figs., Oct., 1947.—With notes on the plates—photographs by C. A. Gibson-Hill.

GIBSON-HILL, C. A. The normal food of tropic-birds (*Phaëthon* spp.). Ibis, **89**: 658–661, Dec. 10, 1947.

GOATER, BARRY. Hobby attacking Green Woodpecker. Brit. Birds, **41** (1): 22–23, Jan., 1948.

GODFREY, W. EARL. A new Long-eared Owl. Canad. Field-Nat., **61** (6): 196–197, Nov.–Dec., 1947.—*Asio otus tuftsi* (South Arm, Last Mountain Lake, Saskatchewan), new subspecies.

GOOCH, BERNARD. Pattering action of feeding Lapwing and probing of Starlings compared. Brit. Birds, **41** (2): 59–60, Feb., 1948.

GOODWIN, DEREK. Breeding-behaviour in domestic pigeons four weeks old. Ibis, **89**: 656–658, Dec. 10, 1947.

GOODWIN, DEREK. Some abnormal sexual fixations in birds. Ibis, **90**: 45–48, Jan. 26, 1948.

GOODWIN, DEREK. The mating ceremonial of some doves. Brit. Birds, **41** (1): 12–13, Jan., 1948.

GOODWIN, GEORGE G. Don't let the headlines fool you. Nat. Hist., **56** (7): 304–305, 3 figs., Sept., 1947.—On falconry.

GRAY, J. Migration of vertebrate animals. Endeavour, **5** (19): 83–89, 4 figs., July, 1946.

GRAYCE, ROBERT L. Birds of the Valley of Mexico. Bull. Mass. Audubon Soc., **31** (9): 363–368, 3 photos., Jan., 1948.

GREENHALGH, CLIFTON M. Second record of the Golden-crowned Sparrow in Utah. Condor, **50** (1): 46, Jan. 20, 1948.

GREGORY, WILLIAM KING. Biographical memoir of Frank Michler Chapman, 1864–1945. Nat. Acad. Sci., Biogr. Mem., **25** (5): 111–145, 1 pl., 1948.

GRIFFIN, DONALD R., AND HOCK, RAYMOND J. Experiments on bird navigation. Science, **107** (2779): 347–349, fig. 1, Apr. 2, 1948.

GRISCOM, LUDLOW. Duck shooting can be saved. Field and Stream, **52** (9): 22–23, 83–85, 3 figs., Jan., 1948.

GRISCOM, LUDLOW. The changing seasons. A summary of the fall migration. Aud. Field Notes, **2** (1): 3–11, 14–24, Jan., 1948.

GROSS, ALFRED O. Gulls of Muskeget Island. Bull. Mass. Aud. Soc., **32** (2): 43–47, 3 figs., Mar., 1948.

GULLION, GORDON W. A mid-winter record of the Barn Swallow in Lane County, Oregon. Condor, **50** (2): 92, Mar. 16, 1948.

GULLION, GORDON W. An early record of the Western Kingbird in Lane County, Oregon. Condor, **50** (1): 46, Jan. 20, 1948.

GULOTTA, WILHELMINA, AND LEROY. Banding Mourning Doves in eastern Nebraska. Nebr. Bird Rev., **15** (2): 12–16, Mar., 1948.

GUSH, GEOFFREY H. Short-eared Owl taking stoat. Brit. Birds, **41** (3): 87, Mar. 1, 1948.

GUY, G. Crested Grebe in salt water. New Zeal. Bird Notes, **2** (7): 154, Jan., 1948.

GWYNNE, A. J. Notes on the Brown Honeyeater. Emu, **47** (3): 161–164, pl. 1, Jan. 28, 1948.

HACHISUKA, THE MARQUESS. Contributions to the ornithology of South China, Pt. 1, The bird specimens examined in Canton. Tori, **11** (53–54): 352–369, Dec., 1942.

HACHISUKA, THE MARQUESS. Contributions to the Ornithology of South China. Pt. 2. The bird specimens examined at Nanning. Tori, **11** (55): 529–573, Sept., 1944.

HACHISUKA, THE MARQUESS. Description of a new tailor-bird from the Philippine Islands. Tori, **11** (55): 525–528, 1 fig., Sept., 1944.—*Orthotomus nigrogularis* (mountain forest of Hamihthan or Tumadgopt, southern Mindanao), new species.

HACHISUKA, THE MARQUESS. List of birds described by the Japanese authors. Tori, **11** (53–54): 270–351, Dec., 1942.—Dr. Ijima in 1893 was the first Japanese ornithologist to propose a new bird; since that time eleven other Japanese ornithologists have proposed new genera, species, subspecies or mutations as follows:

Hachisuka 18 genera, species etc. 121; Ishizawa 1 "var."; Isii, 2 subspecies; Kumagi, 3 subspecies, 1 "mut."; Kuroda, 1 genus, 104 species, etc.; Momiyama, 5 genera, 137 species, etc.; Mori, 11 species, etc.; Ogawa, 6 subspecies; Taka-Tsukasa, 1 genus, 6 species, etc.; Uchida, 2 subspecies; Yamashina, 3 genera, 34 species, etc. Some of these figures are duplicated because of joint authorship; there are elaborate tabulations showing each author's "batting average."

HACHLER, EMIL. Ornithologické poznámky z Kyjovska. II. Sborník, **15**: 7–14, 1944.

HAGEN, YNGVAR. Spiller dvergfalken i enkelte tilfeller en rolle som beskytter av gråtrostkolonier i fjellet? Vår Fågelvärld, **6** (3–4): 137–141, 1947.

HALLE, LOUIS J., JR. The American Robin. Aud. Mag., **50** (2): 71–75, 3 figs., Mar.–Apr., 1948.

HANNA, WILSON C. Eastern Kingbird in San Bernardino Valley, California. Condor, **50** (1): 46, Jan. 20, 1948.

HANSBOROUGH, DAVIS A. The effect of increased nicotinic acid in the egg on the development of the chick embryo. Growth, **11** (3): 177–184, figs. 1–9, Sept., 1947.

HARBER, D. D. Courtship feeding of Willow-Warbler. Brit. Birds, **41** (1): 21, Jan., 1948.

HARRISON, JAMES M. Further comments on *Fringilla coelebs hortensis* Brehm. Ibis, **89**: 664, Dec. 10, 1947.

HARRISON, JEFFERY. The breeding plumage of some western palaearctic wading birds. Ibis, **90**: 72–76, Jan. 26, 1948.

HARTHAN, A. J. Fledging-period of Little Owl. Brit. Birds, **41** (1): 22, Jan., 1948.

HARTLEY, P. H. T. The food of the Long-eared Owl in Iraq. Ibis, **89**: 566–569, Dec. 10, 1947.

HAWBECKER, ALBERT C. Analysis of variation in western races of the White-breasted Nuthatch. Condor, **50** (1): 26–39, figs. 7–11, Jan. 20, 1948.

HAYS, F. A. Thyroxine and artificial light as activators in the spermatogenesis of males. Poultry Sci., **27** (1): 84–86, Jan., 1948.

HEBAR[illegible]REDERICK V. Bald Eagle eating shoat on highway. Wils. Bull., **60** (1): 53, Ma.., 1948.

HEDGPETH, JOEL W. On the shores of Laguna Madre, Texas. Aud. Mag., **50** (2): 100–107, 5 figs., Mar.–Apr., 1948.

HENDERSON, MARY. Calls of Shoveler with young. Brit. Birds, **41** (1): 25, Jan., 1948.

HERING, LOUISE. Nesting birds of the Black Forest, Colorado. Condor, **50** (2): 49–56, figs. 12–15, Mar. 16, 1948.

HIGMAN, H. W. Clark's Nutcracker. Nat. Mag., **40** (8): 431, 2 figs., Oct., 1947.

HJERSMAN, HENRY A. The California Valley Quail in New Zealand. Calif. Fish and Game, **34** (1): 33–36, fig. 11, Jan. 30, 1948.

HOHN, E. O. Courtship display and species recognition in Whooper Swan. Brit. Birds, **41** (2): 54, Feb., 1948.

HØJGAARD, MOGENS. Sangen hos en Tornirisk (*Carduelis cannabina* (L.)) opmadet af Kanariefugl (*Serinus canaria* (L.)). Dansk Orn. Forenings Tids., **41** (1): 78–79, May, 1947.

HOLMAN, F. C. Birds of Gold Coast. Ibis, **89**: 623–650, Dec. 10, 1947.

HOOGERWERF, A. Mededeelingen over Sterns, bij Java waargenomen. Limosa, **20** (4): 197–200, plates 6–7, Dec., 1947.

HOOGERWERF, A. Nog iets over de verspreiding van *Copsychus saularis* subspp. op Java. Chronica Nat., **103** (12): 235–237, Dec., 1947.—With a summary in English.

HOOGERWERF, A. Ornithologische ervaringen tijdens een naar het Natuurmonument Poelau Doewa gemaakte dienst-tournee. Limosa, **20** (4): 193–196, plates 2–5, Dec., 1947.

HOOKE, A. G. A note on the Lyre-birds of Sherbrooke Forest. Victor. Nat., **64** (9): 177–179, Jan. 8, 1948.

HOPE, JOHN. Longevity of Chaffinch. Brit. Birds, **41** (2): 52, Feb., 1948.

HOPKINS, R. C. Waterfowl management research project 6-R. Wis. Wildl. Research Quart. Progr. Rep., **6** (3): 16–34, Oct., 1947.

HORVATH, S. M., ET AL. Survival time of various warm-blooded animals in extreme cold. Science, **107** (2772): 171–172, fig. 1, Feb. 13, 1948.

HOXMARK, GUILLERMO. La receptividad del Hornero. Anal. Soc. Cient. Argentina, **144** (6): 617–622, 1947.

HUDSON, GEORGE ELFORD. Studies on the muscles of the pelvic appendage in birds. 2: The heterogeneous order Falconiformes. Amer. Midl. Nat., **39** (1): 102–127, Jan., 1948.

HULME, DEREK C. Courtship feeding of Blue Tit. Brit. Birds, **40** (12): 374–375, Dec. 1, 1947.

HUTSON, H. P. W. Observations on the nesting of some birds around Delhi. Ibis, **89**: 569–576, Dec. 10, 1947.

HUXLEY, J. S. Notes on the problem of geographical differences in tameness in birds. Ibis, **89**: 539–552, Dec. 10, 1947.

INGLIS, C. M. The Starlings and Mynas of Bengal with special reference to north Bengal. Jour. Bengal Nat. Hist. Soc., **22** (1): 3–5, July, 1947.

IPSEN, JØRGEN MOLT. Ridernes Livsforhold i Højsommeren. Dansk Orn. Forenings Tids., **41** (1): 49–55, 3 figs., May, 1947.—With summary in English.

JAEGER, EDMUND C. Does the Poor-will "hibernate"? Condor, **50** (1): 45–46, Jan. 20, 1948.

JAEGER, EDMUND C. Notes on behavior of the Turkey Vulture and Prairie Falcon. Condor, **50** (2): 90–91, Mar. 16, 1948.

JESPERSEN, POUL. Hedehøgen (*Circus pygargus* (L.)) som Ynglefugl i Danmark. Dansk Orn. Forenings Tids., **41** (1): 61–72, 1 map, May, 1947.—With a summary in English.

JEWETT, STANLEY G. The Eastern Brant in Idaho. Condor, **50** (2): 93, Mar. 16, 1948.

JONES, TERRY. Nesting swans. Avic. Mag., **53** (6): 206–209, 1 photo., Nov.–Dec., 1947.

JUNGE, G. C. A. Resultaten van het ringonderzoek betreffende den vogeltrek, ingesteld door het Rijksmuseum van Natuurlijke Historie te Leiden, 33. Limosa, **20** (4): 200–213, Dec., 1947.

JUNGE, G. C. A. Trekvogels 1946. Ardea, **35** (3–4): 230–236, Dec., 1947.

KAY, G. T. The Glaucous Gull in winter. Brit. Birds, **40** (12): 369–373, pls. 40–53, 2 figs., Dec. 1, 1947.

KEAST, J. A., AND MC GILL, A. R. The Sooty Shearwater in Australia. Emu, **47** (3): 199–202, pl. 16, 1 map, Jan. 28, 1948.

KELSO, LEON. Embryo taxonomists. Biol Leafl. (privat. publ.), **40**: 1–4, Feb. 27, 1948.

KENYON, KARL W. Watching the Osprey in Lower California. Nat. Hist., **57** (2): 86–90, 6 figs., Feb., 1948.

KEVE, ANDRÁS. Die im Naturhistorischen Museum in Wien befindlichen zentralasiatischen Vogel-Kollektionen alter russischer Forscher. Annal. Naturhist. Mus. Wien, **55**: 180–184, Dec., 1947.

KIRKPATRICK, CHARLES M., AND CONWAY, Clinton H. The winter foods of some Indiana owls. Amer. Midl. Nat., 38 (3): 755–766, Nov., 1947.

KLEINER, ENDRE, UND NASVÁRI, MIKLÓS. Synchrone ornithologische Beobachtungen an den Gewässern Pannoniens im Herbst 1941. Arbeiten Ungarischen Biol. Forschungsinstitutes, 14: 132–146, 1 map, 1942.—With a summary in Hungarian.

KNOWLES, CECILIA. Slavonian Grebe rearing two broods. Brit. Birds, 41 (2): 56, Feb., 1948.

KOZLIK, F. M. Pheasant management research project 9-R. Wis. Wildl. Research Quart. Progr. Rep., 6 (3): 51–76, Oct., 1947.

KRITZLER, HENRY. Observations on behavior in captive fulmars. Condor, 50 (1): 5–15, figs. 1–3, Jan. 20, 1948.

KUMLIEN, L., AND HOLLISTER, N. The birds of Wisconsin (cont.). Pass. Pigeon, 10 (1): 11–24, Jan., 1948.

KUNO, K. The avifauna of Mt. Echigo Koma after the breeding season. Tori, 11 (53–54): 388–405, 1 fig., 1 map, Dec., 1942.—In Japanese; scientific names in Roman characters.

KURODA, THE MARQUESS. A list of the Birds of Paradise and the Bower-Birds. Tori, 11 (55): 615–650, Sept., 1944.

KURODA, THE MARQUIS. A study on *Anas oustaleti* II. Tori, 11 (53–54): 443–448, 3 figs., Dec., 1942.—(In Japanese).

KUWATA, T. A study of the breeding birds at Sumiyoshi-ura. Tori, 11 (53–54): 406–433, 22 figs., Dec., 1942.—In Japanese; scientific names in Roman characters.

LABITTE, ANDRÉ. Contribution à l'étude biologique des oiseaux du pays drouais et calendrier ornithologique pour les années 1940 à 1944 (suite). Oiseau, 17 (1): 102–121, 1947.

LACK, DAVID. The significance of clutch-size. Part 3. Some interspecific comparisons. Ibis, 90: 25–45, Jan. 26, 1948.

LADIGES, J. C. Ongewone zang van *Sylvia communis* (Lath.). Ardea, 35 (3–4): 251–252, Dec., 1947.

LARRISON, EARL J. Field guide to the birds of King County, Washington. Seattle Aud. Soc., 1: 3–66, pls. 1–8, Nov., 1947.

LASKEY, AMELIA R. Birds feeding on termites. Migrant, 18 (4): 61, Dec., 1947.

LEASK, MAURICE F. Observations on the Tooth-billed Bower-bird (*Scenopoeetes dentirostris*). Australian Zool., 11 (2): 158, June 20, 1947.

LEBRET, T. Een kleine broedkolonie van de Kwak, *Nycticorax nycticorax* (L.), in Nederland in 1946 en 1947. Ardea, 35 (3–4): 149–156, pl. 1, Dec., 1947.

LEBRET, T. Verandering van de terreinkeuze bij de doortrekkende Slobeenden, *Spatula clypeata*, aan het Hollandsch Diep. Ardea, 35 (3–4): 246–247, Dec., 1947.

LEBRET, T. Voedselrelaties bij watervogels, in het bijzonder die tussen Meerkoet, *Fulica atra* en duikeenden, *Nyroca*-species. Ardea, 35 (3–4): 244–246, Dec., 1947.

LEE, HENRY F., ET AL. Heterologous tumor transplantation by intravenous inoculation of the chick embryo. Science, 107 (2780): 374, Apr. 9, 1948.

LEE, R. D., AND BRYANT, C. E. A count of Helmeted Honeyeaters. Emu, 47 (3): 230–231, Jan. 28, 1948.

LEEDS, R. A. Abnormal eggs of White-plumed Honeyeater. Emu, 47 (3): 210, Jan. 28, 1948.

LEES, JOHN. Winter feeding hours of Robins, Blackbirds, and Blue Tits. Brit. Birds, 41 (3): 71–76, 1 fig., Mar. 1, 1948.

LEHTI, ROBERT W. The Golden Eagle attacking antelope. Jour. Wildl. Manage., 11 (4): 348–349, Oct., 1947.

LERNER, I. MICHAEL, AND CRUDEN, DOROTHY M. The heritability of accumulative monthly and annual egg production. Poultry Sci., 27 (1): 67–78, Jan., 1948.

LIGON, J. STOKLEY. History and management of Merriam's Wild Turkey. Univ. N. Mex. Publ. Biol., no. 1: 1–84, pls. 1–19, figs. 1–2, 1946.

LIGON, J. STOKLEY. Upland game bird restoration through trapping and transplanting. Univ. N. Mex. Publ. Biol., no. 2: 1–77, pls. 1–21, figs. 1–5, 1946.

LIND, H., AND STEINBACH, A. Gransangeren (*Phylloscopus collybita* (Vieill.)) paa Randersegnen. Dansk Orn. Forenings Tids., 41 (1): 75–76, May, 1947.

LONGLEY, WILLIAM H. Changes in Minnesota bird life. Flicker, 19 (4): 87–89, Dec., 1947.

LØPPENTHIN, BERNT. "Dvaergmaagekolonien" paa Tyreholm. Dansk Orn. Forenings Tids., 41 (1): 76–77, May, 1947.

LØPPENTHIN, BERNT. Efteraarstraek af Rovfugle over Sydsjaelland. Dansk Orn. Forenings Tids., 41 (1): 77, May, 1947.

LØPPENTHIN, BERNT. Recent changes in the list of Danish breeding birds. Ibis, 90: 86–90, Jan. 26, 1948.

LØPPENTHIN, BERNT, Skovsneppe (*Scolopax rusticola* L.) Ynglefugl paa Samsø. Dansk Orn. Forenings Tids., 41 (1): 77, May, 1947.

LØPPENTHIN, BERNT. Svartbag (*Larus marinus* L.) og Norsk Sildemaage (*Larus fuscus intermedius* Schiøler) Ynglefugle ved Samsø. Dansk Orn. Foren. Tidsskr., 41 (2): 116–120, July, 1947.—With summary in English.

LOVELL. HARVEY B. Mountain Vireo nests in the Great Smoky Mountains. Migrant, 18 (4): 51–53, Dec., 1947.

LOWE, PERCY R. Note on the systematic position of *Hypocolius*. Proc. Zool. Soc. London, 117 (Pt. 1): 109–114, 10 figs., May, 1947.

LOWE, WILLOUGHBY P. Specimens of *Psephotus pulcherrimus*. Ibis, 89: 663, Dec. 10, 1947.

LYE, R. J. Two types of "injury-feigning" by Snipe. Brit. Birds, 41 (3): 90, Mar. 1, 1948.

MACDONALD, J. D. Altitudinal variation in *Phormoplectes insignis* (Sharpe). Ibis, 89: 661–662, Dec. 10, 1947.

MADSEN, HARRY. Maerkelig Dødsaarsag hos Skade (*Pica pica* (L.)). Dansk Orn. Foren. Tidsskr., 41 (2): 124–125, fig. 1, July, 1947.

MATHEWS, GREGORY M. *Cymodroma grallaria*. Ibis, 90: 134–136, Jan. 26, 1948.

MAYO, ANTHONY L. W. Birds seen in the tropical Atlantic and western approaches to Gibraltar. Ibis, 90: 22–25, Jan. 26, 1948.

MAYR, ERNST. Geographic variation in the Reed-Warbler. Emu, 47 (3): 205–210, 1 fig., Jan. 28, 1948.

MAYR, ERNST. Le nom correct de la Pie-grièche du Thibet. Oiseau, 17 (1): 4–8, 1947.

MAYR, ERNST, AND AMADON, DEAN. A review of the Dicaeidae. Amer. Mus. Novit., 1360: 1–32, figs. 1–8, Oct. 31, 1947.

MC ATEE, W. L. Attracting birds. Fish and Wildl. Serv., U. S. Dept. Int., Conserv. Bull. 1: 1–13, figs. 1–12, 1947.

MC EWEN, ENID. Display hovering of Bullfinch. Brit. Birds, 41 (1): 19, Jan., 1948.

MC GILL, A. R. The Asiatic Ring Dove as an escapee. Emu, 47 (3): 232–233, Jan. 28, 1948.

MC GINNIS, JAMES, AND CARVER, J. S. The effect of calcium deficiency on feather color in New Hampshire chicks. Poultry Sci., 27 (1): 115–116, Jan., 1948.

MC MILLAN, EBEN. A nesting record for the Red Crossbill in California. Condor, 50 (1): 44, Jan. 20, 1948.

MEIKLEJOHN, M. F. M. Call notes of Whiskered Tern. Brit. Birds, **41** (1): 30–31, Jan., 1948.

MEIKLEJOHN, M. F. M. Summer notes on birds of Teheran and the Alborz Mountains. Ibis, **90**: 76–86, Jan. 26, 1948.

MEINERTZHAGEN, R. Changes of name. Ibis, **89**: 669–670, Dec. 10, 1947.—*Pyrrhocorax* to *Coracia*.

MEINERTZHAGEN, R. Notes on Western Palaearctic birds, with two new races. Bull. Brit. Orn. Club, **67** (474): 90–98, Oct., 1947.—*Emberiza calandra clanceyi* (Aran Isles, Co. Galway, West Ireland), and *Alauda arvensis theresae* (Corofin, Co. Clare), new subspecies.

MEINERTZHAGEN, R. The systematic position of *Hypocolius* Bonaparte. Ibis, **89**: 666–667, Dec. 10, 1947.

MELLO-LEITAO, CANDIDO DE. As zonas de fauna da América tropical. Rev. Brasil. Geogr., **8** (1): 71–118, 3 maps, Jan.–Mar., 1946.—With summary in various languages.

MESSNER, CLARENCE J., AND HAZEL W. Where to find some of Michigan's uncommon birds. Jack-Pine Warbler, **26** (1): 3–15, pls. 1–3, 2 figs., Jan., 1948.

MEYLAN, OLIVIER, AND HALLER, WERNER. Artliste der schweizerischen Vögel. Buchdruckerei Neue Aargauer Zeit. Aarau: 3–51, 1946.

MILLER, ALDEN H. Further observations on variation in Canyon Wrens. Condor, **50** (2): 83–85, Mar. 16, 1948.

MILLER, ALDEN H. White-winged Junco parasitized by Cowbird. Condor, **50** (2): 92, Mar. 16, 1948.

MILLER, R. F., AND BOYD, IVAN L. Migration records of birds in East-Central Kansas. Trans. Kansas Acad. Scien., **50** (1): 62–63, June, 1947.

MISCELLANEOUS. A field list of birds of the District of Columbia region. Aud. Soc. D. C.: 1–39, Feb., 1947.

MISCELLANEOUS. Bull. Mass. Aud. Soc., Rec. New England Birds, **3** (8): 93–102, 1 fig., Aug., 1947.

MISCELLANEOUS. Bull. Mass. Aud. Soc., Rec. New England Birds, **3** (10): 125–141, 1 fig., Oct., 1947.

MISCELLANEOUS. Classified summarised notes. New Zeal. Bird Notes, **2** (7): 155–176, Jan., 1948.—Birds seen in 1947.

MISCELLANEOUS. Indiana Audubon Society yearbook, **25**: 5–71, 1947.

MISCELLANEOUS. Japanese ornithology and mammalogy during World War II. Genl. Headq. Supreme Comm. Allied Powers, Nat. Resources Sect., **102**: 2–47, Jan. 30, 1948.—An annotated bibliography.

MØHL-HANSEN, U. Bemaerkninger om Ynglefuglene paa Hirsholmene 1946. Undersøgelser i Juni Maaned. Dansk Orn. Forenings Tids., **41** (1): 38–49, 6 figs., May, 1947.—(With a summary in English).

MOLTONI, EDGARDO. Cattura di Poiana codabianca *Buteo r. rufinus* (Cretzschmar) —nei pressi di Roma. Riv. Ital. Orn., **18** (1): 42–45, 1 pl., Jan., 1948.

MOLTONI, EDGARDO. Catture di uccelli non comuni. Riv. Ital. Orn., **18** (1): 37–41, Jan., 1948.

MOLTONI, EDGARDO. Pesci cacciatori d'uccelli. Riv. Ital. Orn., **18** (1): 45–47, Jan., 1948.

MONSON, GALE. The Starling in Arizona. Condor, **50** (1): 45, Jan. 20, 1948.

MOREAU, R. E. Relations between number in brood, feeding-rate and nesting period in nine species of birds in Tanganyika Territory. Jour. Anim. Ecol., **16** (2): 205–209, Nov., 1947.

MOREAU, R. E. Some recent terms and tendencies in bird taxonomy. **Ibis, 90:** 102–111, Jan. 26, 1948.

MOREAU, R. E. The relationship between *Phyllastrephus placidus grotei* Rchw., *P. f. fischeri* Rchw. and *P. p. münzneri* Rchw. Bull. Brit. Orn. Club, **67** (474): 88–90, Oct., 1947.

MORGAN, ALLEN H. White-tailed Kites roosting together. **Condor, 50** (2): 92–93, Mar. 16, 1948.

MORRISON, ALASTAIR. A list of the birds observed at the Hacienda Huarapa, department of Huanuco, Peru. Ibis, **90:** 126–128, Jan. 26, 1948.

MORRISON, ALASTAIR. A new race of Atlapetes from Peru. **Bull. Brit. Orn. Club, 67** (474): 88, Oct., 1947.—*Atlapetes rufigenis forbesi* (Pomayaco, Department of Apurimac, Peru), new subspecies.

MORRISON, ALASTAIR. British aviculture: prospect and retrospect. **Avic. Mag., 54** (1): 3–19, Jan.–Feb., 1948.

MORRISON, ALASTAIR. Chilean waterfowl. Avic. Mag., **53** (6): 200–206, Nov.–Dec., 1947.

MORRISON, ALASTAIR. *Emberiza jankowskii* from near Peking. **Ibis, 90:** 132, Jan. 26, 1948.

MORRISON, ALASTAIR. Notes on Peruvian birds. Ibis, **90:** 130–132, Jan. 26, 1948.

MORRISON, ALASTAIR. Notes on the birds of the Pampas River Valley, south Peru. Ibis, **90:** 119–126, Jan. 26, 1948.

NAESLUND, JOHN. Experiments to show the influence of hormone injections in hen's eggs on the development of the fetus. Zool. Bidrag från Uppsala, **25:** 169–200, 30 figs., 1947.

NEAL, CHARLES. Yellow-bellied Sapsucker breeding in Georgia. **Oriole, 12** (4): 45–46, Oct., 1947.—First breeding record.

NELDER, J. A. Display of Wren. Brit. Birds, **41** (3): 85, Mar. 1, 1948.

NICHOLS, J. T. A picture of bird migration with particular reference to Long Island, New York. Birds of Long Is., [5]: 117–136, Jan., 1948.

NOELL, G. W. Bald Eagle captures tern. Wils. Bull., **60** (1): 53, Mar., 1948.

NORTH, M. E. W. Breeding of the Egyptian Vulture in Kenya Colony. **Ibis, 89:** 662–663, Dec. 10, 1947.

NORTH, M. E. W. The Lammergeyer in Kenya Colony. **Ibis, 90:** 318–341, Jan. 26, 1948.

NOVRUP, LEO. Jagtfalk (*Falco rusticolus* L.) i Vestjylland. **Dansk Orn. Forenings Tids., 41** (1): 78, May, 1947.

OCHSNER, M. Nochmals zum Thama "Nisthöhlenkontrolle." **Voegel Heimat, 18** (6): 102–103, 1 fig., Mar., 1948.

OLAFSSON, O. Ny Forekomst af Pirol (*Oriolus oriolus* (L.)) i Sydsjaelland. **Dansk** Orn. Forenings Tids., **41** (1): 78, May, 1947.

OLSSON, VIKING. Redogörelse för en fågelbonitering vid nedre Delälven 1947. Vår Fågelvärld, 6 (3–4): 93–125, 22 figs., 1947.

O'NEIL, J. B.; JOWSEY, J. R., ET AL. Determination of the fate of phosphorus in the laying hen by means of radiophosphorus (P^{32}). Science, **107** (2777): 295–296, figs. 1–3, Mar. 19, 1948.

ORR, ELLISON. Recollections of the migrations of waterfowl. **Iowa Bird Life, 18** (1): 13–15, 1 fig., Mar., 1948.

PAKENHAM, R. H. W. Field notes on the birds of Zanzibar and Pemba Islands.—Fifth series. Ibis, **90:** 98–102, Jan. 26, 1948.

PARKES, KENNETH C., AND AMADON, DEAN. The winter range of the Kennicott Willow Warbler. Condor, **50** (2): 86–87, Mar. 16, 1948.

PARRINDER, E. R. The Little Ringed Plover in the London area in 1947. Brit. Birds, **41** (2): 41–45, Feb., 1948.

PÁTKAI, IMRE. Bestandschätzung der Brutvögel der Tihanyerhalbinsel. Arbeiten Ungarischen Biol. Forschungsinstitutes, **14**: 231–238, 1 map, 1942.—With a summary in German.

PAYN, W. H. Notes from Tunisia and eastern Algeria: February 1943 to April 1944. Ibis, **90**: 1–21, Jan. 26, 1948.

PETERSON, ROGER TORY. Arizona Junco. Wilson Bull., **60** (1): 5, 1 pl. (col.), Mar., 1948.

PETERSON, ROGER TORY. Eagle man. Aud. Mag., **50** (1) sect. 1: 2–11, 6 figs., Jan.–Feb., 1948.—On Charles Broley.

PHILLIPS, W. W. A. A crocodile attacking an injured Garganey Duck. Ibis, **89**: 661, Dec. 10, 1947.

PINTO, OLIVÉRIO M. DE O., AND CAMARGO, EURICO A. DE. Sobre uma coleção de aves do Rio das Mortes (Estado de Mato Grosso). Papeis Avulsos Dept. Zool. Sao Paulo, **8** (26): 287–336, Nov. 21, 1948.—*Siltasomus griseicapillus transitivus* (Chavantina), new subspecies; *Daptrius americanus pelzelni* (Chavantina), new name.

PITMAN, C. R. S. The occurrence of *Francolinus n. nobilis* in south-western Uganda. Ibis, **90**: 129–130, Jan. 26, 1948.

PLÓTNICK, RUBÉN. Registro de la silueta de las aves. Revista argentina Zoogeografia, **5**: 81–86, 2 plates, 1945.—With a summary in English.

POVAZSAY, L. Some notes on Hungarian Cuckoos. Oologists' Rec., **22** (1): 8–13, Mar., 1948.

PRESTON, FRANK W. Ornithological notes from the glacial foreland. Ruffed Grouse, **2**: 17–23, 1948.

PRIOLO, ANGELO. Catture interessanti in Sicilia. Riv. Ital. Orn., **18** (1): 52–54, Jan., 1948.

RAND, AUSTIN L. Birds are where you find them—if luck is with you. Chicago Nat. Hist. Mus. Bull., **19** (4): 4–5, 8, 1 fig., Apr., 1948.

RAND, A. L. Geographical variation int the Loon, *Gavia immer* (Brunnich). Canad. Field-Nat., **61** (6): 193–195, Nov.–Dec., 1947.

RAND, A. L. List of Yukon birds and those of the Canol Road. Canada Dept. Mines and Resources, Nat. Mus. Canada, Bull. **105** (Biol. Series 33): 1–76, 1946.

RICHARDSON, R. A. Sub-song of juvenile Goldfinch. Brit. Birds, **41** (2): 51, Feb., 1948.

RICHTER, CARL H. Breeding birds of Oconto County [Wisconsin]. Pass. Pigeon **10** (1): 3–6, 4 figs., Jan., 1948.

RIDLEY, M. W. "Smoke-bathing" of Jackdaw. Brit. Birds, **41** (3): 83, Mar. 1, 1948.

RIPLEY, DILLON. The present status of the Hawaiian Goose. Avic. Mag., **53** (6): 229–230, Nov.–Dec., 1947.

RISDON, D. H. S. Waterfowl as aviary birds. Avic. Mag., **53** (6): 212–215, Nov.–Dec., 1947.

RIVOIRE, ANDRÉ. Contribution à l'étude du *Merops apiaster*. Oiseau, **17** (1): 23–43, 7 figs., 1947.

RIVOIRE, A., ET HUE, FR. La Crécerellette (Falco Naumanni) nidificatrice en France. Oiseau, **17** (1): 94–101, 1 fig., 1947.

ROBERTS, E. L. Fulmar Petrel appropriating Herring-Gull's nest. Brit. Birds, **41** (1): 26–27, Jan., 1948.

ROBINSON, M. G. Behaviour of Black-throated Diver. Brit. Birds, **41** (1): 27, Jan., 1948.

ROBSON, F. D. Kiwis in captivity. Hawkes Bay Art Gallery and Mus., New Zealand: 1–8, 2 figs., Sept., 1947.

ROGERS, IRL. The effect of DDT on a bird population. Condor, **50** (2): 89–90, Mar. 16, 1948.

ROTHSCHILD, MIRIAM. The Wood-pigeon (*Columba palumbus* L.) on the poultry market: preliminary note. Ibis, **89**: 611–615, Dec. 10, 1947.

ROWE, E. G. The breeding biology of *Aquila verreauxi* Lesson (concl.). Ibis, **89**: 576–606, Dec. 10, 1947.

RUDEBECK, GUSTAF. Nyare observationer rörande höststräcket av rödstrupig piplärka (*Anthus cervinus* Pall.) över södra Sverige. Vår Fågelvärld, **6** (3–4): 125–137, 1947.

RUSSELL, WARD C. A record of *Tyrannus melancholicus occidentalis* for California. Condor, **50** (2): 90, Mar. 16, 1948.

SALMON, L. Display of Yellow Bunting. Brit. Birds, **41** (3): 84, Mar. 1, 1948.

SALOMONSEN, FINN. De sibiriske Snespurve (*Plectrophenax nivalis* (L.)). Dansk. Orn. Foren. Tidsskr., **41** (2): 136–140, pl. 4, July, 1947.—*P. n. pallidior* (De Castries, Amurland, Ostsibirien), new subspecies.—With summary in English.

SALOMONSEN, FINN. Den geografiske Variation hos Lille Regnspove (*Numenius phaeopus* (L.)) i Europa. Dansk Orn. Foren. Tidsskr., **41** (2): 143–154, July, 1947. —With summary in English.

SALOMONSEN, FINN. En hybrid mellem Grønspaette (*Picus v. viridis* L.) og Graaspaette (*Picus c. canus* Gm.) Vår Fågelvärld, **6** (3–4): 141–144, 1 photo., 1947.

SALOMONSEN, FINN. Første foreløbige Liste over genfundne grønlandske Ringfugle. Dansk Orn. Foren. Tidsskr., **41** (2): 141–143, July, 1947.—With summary in English.

SALOMONSEN, FINN. Ringmaerkning af Traekfugle paa Christiansø. Dansk Orn. Foren. Tidsskr., **41** (2): 126–135, figs. 1–3, July, 1947.—With summary in English.

SALOMONSEN, FINN. Sabines Bekkasin *Capella gallinago* mut. *sabini* (Vig.) i Danmark. Dansk Orn. Forenings Tids., **41** (1): 72–75, 1 fig., May, 1947.—With a summary in English.

SAPORITI, ENRIQUE J. Biologia del Chaja, Chauna torquata (Oken). Anales Soc. Cien. Argentina, **144**: 434–446, 12 figs., Sept., 1947.

SCHIFFERLI, A. Vogelwarte Radolfzell. Vogelwarte Helgoland. Orn. Beob., **45** (1): 31–32, Feb., 1948.

SCHUSTER, LUDWIG. Weiteres zum Thema Borkenkäfer und Vogelschutz. Voegel Heimat, **18** (6): 97–100, 2 figs., Mar., 1948.

SCOTT, PETER. The Emperor Goose (*Anser canagicus*). Avic. Mag., **53** (6): 197–198, 1 photo (col.), Nov.–Dec., 1947.

SERÉBROVSKIJ, P. Zur Kritik der Formenkreislehre (eine Krise in der Systematik der Vögel). Travaux Institut Zool. Acad. Scien. URSS, **6** (4): 158–189, 1941.—With a summary in German.

SERVENTY, D. L. The Great-winged Petrel in western Australia. Emu, **47** (3): 211–213, 1 map, Jan. 28, 1948.

SHACKLETON, WALTER. Three cases of parasitism by Cowbirds. Kentucky Warbler, **24** (1): 1–3, 1 fig., Jan., 1948.

SHICK, CHARLES. Sex ratio-egg fertility relationships in the Ring-necked Pheasant. Jour. Wildl. Manage., **11** (4): 302–306, Oct., 1947.

SHOEMAKER, FRANK H. Notes on the nesting of the Acadian and Alder Flycatchers. Nebr. Bird Rev., **15** (2): 31–35, figs. 1–3, Mar., 1948.

SHOFFNER, R. N. The variation within an inbred line of S. C. W. Leghorns. Poultry Sci., **27** (2): 235–236, Mar., 1948.

SIMONDETTI, ING. M. Il Rondone alpino è sempre uccello estivo in quel di Varese? Riv. Ital. Orn., **18** (1): 47–48, Jan., 1948.

SINDING, ERIK. Bestemmelse af Fugletraekkets Højde ved Hjaelp af Afstandsmaaler. Dansk Orn. Forenings Tids., **41** (1): 56–60, May, 1947.—With a summary in English.

SLUITERS, J. E. De broedvogelbevolking in de boschgedeelten van het Amsterdamsche Bosch in 1943, 1944 en 1945. Ardea, **35** (3–4): 183–221, figs. 1–10, Dec., 1947.

SMITH, T. Sub-song of Dipper. Brit. Birds, **41** (3): 86, Mar. 1, 1948.

SOUTHERN, JOHN. Variations in song-periods. Brit. Birds, **41** (2): 50–51, Feb., 1948.

SPENCER, K. G. "Injury-feigning" of Common Snipe. Brit. Birds, **41** (1): 27–28, Jan., 1948.

SPERBER, IVAR. On the mutual influence of closely related species living in the same area. Zool. Bidrag från Uppsala, **25**: 324–327, 1947.

SPOFFORD, WALTER R. A successful nesting of the Peregrine Falcon with three adults present. Migrant, **18** (4): 49–51, Dec., 1947.

SPOFFORD, WALTER R. Another tree-nesting Peregrine Falcon record for Tennessee. Migrant, **18** (4): 60, Dec., 1947.

SPRATT, NELSON T., JR. Development of the early chick blastoderm on synthetic media. Jour. Exper. Biol., **107** (1): 39–64, figs. 1–6, Feb., 1948.

SPRUNT, ALEXANDER, JR. Population survey, tern colonies of the Dry Tortugas, 1947 (concluded). Florida Nat., **21** (2): 25–35, Jan., 1948.

SQUIRES, W. AUSTIN. An erroneous record of the Swallow-tailed Kite in New Brunswick. Can. Field-Nat., **61** (6): 198, Nov.–Dec., 1947.

STEAD, EDGAR F. The New Zealand Falcon. Oologists' Rec., **22** (1): 13–15, Mar., 1948.

STEWART, CHARLES A. Winter birds of the Fontenelle Forest. Nebr. Bird Rev., **15** (2): 24–30, Mar., 1948.

STILES, BRUCE F. The Blue Goose: is it changing its migration through Iowa? Iowa Bird Life, **18** (1): 9–13, 1 fig., Mar., 1948.

STODDARD, HERBERT L. Reminiscences of Wisconsin birding. Pass. Pigeon, **9** (4): 123–129, 2 figs., Oct., 1947.

STOTT, KEN, JR. An albino Eared Grebe at Mono Lake. Condor, **50** (1): 46, Jan. 20, 1948.

STOTT, KEN, JR. Incubation made easy. Zoonooz, **21** (4): 6–7, 1 fig., Apr., 1948.—Australian Bush Turkey.

STRAW, RICHARD M. Notes on the bird life at Fort Benning, Georgia. Oriole, **12** (4) 41–45, Oct., 1947.

SUTTON, GEORGE MIKSCH. The Curve-billed Thrasher in Oklahoma. Condor, **50** (1): 40–43, Jan. 20, 1948.

SVENDSEN, KAJ. Fuglelivet i Kysing Fjord og dens naermeste Omgivelser. Flora og Fauna, **52** (4–5) 97–120, figs. 1–9, Aug., 1946.

TAIBEL, A. M. Ulteriori osservazioni sull' esplicazione delle "cure parentali" negli uccelli del genere *Crax* L. Riv. Ital. Orn., **18** (1): 32–36, Jan., 1948.

TAKAHASHI, T. On the birds bred near Lake Taraika, S. Sakhalin. Tori, **11**, (54–55): 370–388, 12 figs., Dec., 1942.—In Japanese; scientific names in Roman characters.

TAKAHASHI, T. On the birds bred near Lake Taraika, S. Sakhalin. Pt. 2. Tori, 11, (55): 574–587, 12 figs., Sept., 1944.—In Japanese; scientific names in Roman characters.

TALMADGE, ROBERT R. White Pelican and Ring-necked Duck in Humboldt County, California. Condor, 50 (2): 91, Mar. 16, 1948.

TARR, HAROLD E. Albatross in Port Phillip Bay. Emu, 47 (3): 202, Jan. 28, 1948.

TEALE, EDWIN WAY. A day with Alexander Sprunt. Aud. Mag., 50 (1): sect. 1 24–27, 10 figs., Jan.–Feb., 1948.

TEN KATE, C. G. B. Ornithologie van Nederland. Limosa, 20 (4): 232–244, Dec., 1947.

TENNENT, J. R. M. Canada Goose distracting attention of swan from young of another pair. Brit. Birds, 41 (1): 25, Jan., 1948.

TERRES, JOHN K. Bird of tragedy. Aud. Mag., 50 (2): 90–95, 3 figs., Mar.–Apr., 1948.—The Lapland Longspur.

THOMAS, D. A. G. Birds seen in the Northern Territory (cont.). So. Austral. Orn., 18 (7): 62–65, Jan. 9, 1948.

TINBERGEN, N. Social releasers and the experimental method required for their study. Wils. Bull., 60 (1): 6–51, figs. 1–24, Mar., 1948.

TODD, A. C. On *Capillaria bursata* Teixeira de Freitas and Lins de Almeida, 1934. Jour. Tenn. Acad. Sci., 22 (3): 191–193, figs. 1–3, July, 1947.—A worm in intestine of chickens.

TODD, W. E. CLYDE. Systematics of the White-crowned Sparrow. Proc. Biol. Soc. Wash., 61 (4): 19–20, Mar. 4, 1948.—*Zonotrichia leucophrys nigrilora* (Point Natashquan, Quebec), new subspecies.

TOSCHI, AUGUSTO. Annotazioni su alcuni uccelli somali. Riv. Riv. Ital. Orn., 18 (1): 18–31, Jan., 1948.

TSUCHIYA, K. Habits and distribution of *Hydrophasianus c. sinensis* and *Hirundo t. namiyei* in Formosa. Tori, 11, (55): 583–594, 3 figs., Sept., 1844.—(In Japanese).

T[UCKER], B. W. The Bee-eater. Studies of some species rarely photographed. Brit. Birds, 41 (1): 18, pls. 4–8, Jan., 1948.—Photographs by W. E. Higham, H. A. Patrick, and G. K. Yeates.

T[UCKER], B. W. The Scottish Crossbill. Studies of some species rarely photographed. Brit. Birds, 41 (2): 49, pls. 9–14, Feb., 1948.—Photographs by Eric Hosking.

TURNER, LESLIE L. Siskins nesting in S. E. Lancashire. Brit. Birds, 41 (2): 51–52, Feb., 1948.

TWEEDIE, M. W. F. Obituary. Frederick Nutter Chasen. Bull. Raffles Mus., 18: 170–171, Oct., 1947.

UDGAWA, T. The avifauna of Canton City, S. China. Tori, 11, (55): 595–614, Sept., 1944.—In Japanese; scientific names in Roman characters.

VAN DEN AKKER, JOHN B. A suggestion for pinioning birds. Jour. Wildl. Manage., 11 (4): 348, pl. 15, Oct., 1947.

VAN BENEDEN, A. Fidelité du Bruant Zizi à son territoire. Gerfaut, 37 (3): 139–141, 1947.

VAUCHER, CH. Trois nids de Foulques superposés. Nos Oiseaux, 19 (196): 181, Feb., 1948.

VAUGHAN, RICHARD. Blue and normal eggs of Spotted Flycatcher in same clutch. Brit. Birds, 41 (1): 20–21, Jan., 1948.

VERHEYEN, R. De zangvogels van België. Kon. Natuurhist. Mus. België, Part 1: 3–329, 1944.

VERHEYEN, R. La question des races géographiques du Chevalier Gambette. Gerfaut, **37** (3): 113–116, 1947.

VESTAL, ELDEN H. The Starling appears at Leevining, Mono County, California. Condor, **50** (2): 89, Mar. 16, 1948.

VINCENT, JACK. Remarks on *Cisticola distincta* Lynes. Ibis, **89**: 650–652, Dec. 10, 1947.

VLEUGEL, D. A. De duur van de vliegdag van de Gierzwaluw, *Apus a. apus* (L.). Ardea, **35** (3–4): 222–224, Dec., 1947.

VOOUS, K. H.; HENS, P. A.; AND VAN MARLE, J. G. The distinguishing characters of the Steppe-Buzzard. Brit. Birds, **41** (3): 77–82, 1 fig., Mar. 1, 1948.

WAGNER, HELLMUTH OTTO. Der Durchzug von *Buteo swainsoni* in Centralamerika. Orn. Monatsber., **49** (6): 162–166, figs. 1–2, Mar. 15, 1942.

WALKER, LEWIS W. The biggest little sanctuary. Nat. Hist., **57** (4): 173–175, 5 figs., Apr., 1948.—Pintails at San Diego.

WALKINSHAW, LAWRENCE H. Nesting of some passerine birds in western Alaska. Condor, **50** (2): 64–70, figs. 17–20, Mar. 16, 1948.

WAMPOLE, JOHN H. Hawk populations in Nebraska, 1945–1946. Nebr. Bird Rev., **15** (2): 20–23, Mar., 1948.

WARNER, DWAIN W. Occurrence of the Wandering and Black-browed Albatrosses on New Caledonia. Emu, **47** (3): 233, Jan. 28, 1948.

WEBER, A. Différenciation neurofibrillaire des neuroblastes sympathiques et relations primitives de ces derniers avec les cellules de Schwann, chez l'embryon de poulet. Arch. Anat. Microsc. et Morph. Experim., **36** (2): 121–135, 9 figs., 1946–47.

WEEKES, J. T. The nesting habits of some southern Sudan birds. Ibis, **90**: 116–118, Jan. 26, 1948.

WELCH, ARTHUR, AND OAKES, CLIFFORD. Inland flocking of Curlews. Brit. Birds, **40** (12): 376, Dec. 1, 1947.

WESTERMANN, J. H. Bird preservation in the territory of Curaçao. Uitgaven Stud. Suriname Curaçao, **1**: 78–85, Dec., 1946.

WESTERSKOV, KAJ. Vagtlens (*Coturnix c. coturnix* (L.)) Udbredelse og Levevis i Danmark. Dansk Orn. Foren. Tidsskr., **41** (2): 89–115, figs. 1–6, July, 1947.—With summary in English.

WESTON, HENRY G., JR. Spring arrival of summer residents in the Berkeley area, California. Condor, **50** (2): 81–82, fig. 21, Mar. 16, 1948.

WETMORE, ALEXANDER. A second preliminary list of the birds of the Shenandoah National Park (mimeogr.), 1–19, June, 1947.

WETMORE, ALEXANDER. Biographical memoir of Leonhard Hess Stejneger 1851–1943. Natl. Acad. Sci., Biogr. Mem., **24** (4): 145–195, 1 pl., 1946.

WETMORE, ALEXANDER. The races of the Violet-crowned Hummingbird, *Amazilia violiceps*. Wash. Acad. Sci., **37** (3): 103–104, Mar. 15, 1947.

WHITE, C. M. N. *Lamprocolius acuticaudus* and *Mirafra angolensis* in Northern Rhodesia. Ibis, **90**: 136–137, Jan. 26, 1948.

WHITE, C. M. N. Notes on the races of the Cardinal Woodpecker in South and central Africa. Ibis, **89**: 606–611, Dec. 10, 1947.

WHITE, C. M. N. Weights of some Northern Rhodesia birds. Ibis, **90**: 137–138, Jan. 26, 1948.

WICKENS, J. C. Behaviour of Lapwings with eggs and young. Brit. Birds, **41** (1): 28–19, Jan., 1948.

WILLIAMSON, KENNETH. Arctic Terns scavenging. Brit. Birds, **41** (1): 31, Jan., 1948.

WILLIAMSON, KENNETH. Eider Duck plucking down during distraction-display. Ibis, **90**: 142–143, Jan. 26, 1948.

WILLIAMSON, KENNETH. Field-notes on nidification and distraction-display in the Golden Plover. Ibis, **90**: 90–98, Jan. 26, 1948.

WILLIAMSON, KENNETH. Gannet taking bread at sea. Brit. Birds, **41** (1): 26, Jan., 1948.

YAMADA, N. On the artificial breeding of some wild birds. Tori, **11** (53–54): 433–438, 2 figs., Dec., 1942.—In Japanese; scientific names in Roman characters.

YAMADA, N. On the breeding of *Locustella fasciolata* with its young. Tori, **11**, (53–54): 438–443, 3 figs., Dec., 1942.—In Japanese; scientific names in Roman characters).

YAMASHINA, THE MARQUIS. Birds of the Seven Islands of Izu. Tori, **11**, (53–54): 191–270, 1 fig., Dec., 1942.—In Japanese; scientific names in Roman characters.

YAMASHINA, YOSHIMARO. Notes on the Marianas Mallard. Pacif. Sci., **2** (2): 121–124, Apr., 1948.

YAMASHINA, YOSHIMARO. The birds of Taisetsu Volcano-range, Hokkaido. Biogeographica, **1** (1): 14–48, pl. 7 (col.)., Dec., 1945.—With a summary in English.

YAMASHINA, THE MARQUIS, AND TORII, HAJIME. Nidification of Formosan birds III. Tori, **11** (55): 503–524, 10 figs., Sept., 1944.—Observations on sixteen species.

YEO, P. F. Renewed singing of Willow-Warbler. Brit. Birds, **41** (1): 21, Jan., 1948.

YEPES, José. Caracteres biologicos de los principales ambientes definidos por la cadena occidental de las sierras de Córdoba. Revista argentina Zoogeografia, **5**: 55–79, 1945.—With a summary in English.

YOUNGWORTH, WILLIAM. Notes on the color phases of the Western Red-tailed Hawk. Iowa Bird Life, **18** (1): 3, 2 figs., Mar., 1948.

ZLOTNICK, I. The cytoplasmic components of germ-cells during spermatogenesis in the domestic fowl. Quart. Jour. Microscop. Sci., **88** (3): 353–365, figs. 1–35, Sept., 1947.

OBITUARIES

HUBERT LYMAN CLARK, a Member of the American Ornithologists' Union, died in the Mount Auburn Hospital, Cambridge, Massachusetts, July 31, 1947, in his 78th year. He was the son of William S. and Harriet Kapriolani Richards Clark and was born in Amherst, Massachusetts, January 9, 1870. He graduated from Amherst College in 1892, received the degree of Ph.D. from Johns Hopkins in 1897, and in 1927 the honorary degree of D.Sc. from Olivet College, Michigan. His early interests in natural history were in butterflies and birds but, during his graduate course at Johns Hopkins, he studied under Professor W. K. Brooks who enthused him so much in invertebrate zoology that he devoted his activities ever afterward to the study of echinoderms, a subject in which he became a leading authority. In 1899 he married Frances Lee Snell of Baltimore who assisted him on many of his collecting trips and made color sketches from life of many of his specimens. They had four children.

In 1896, while still a graduate student, he made a trip to Jamaica where he contracted yellow fever and was the only survivor of six victims of the disease. This attack caused a deafness which changed the whole course of his life by preventing him from continuing the profession of teaching for which he was especially adapted. He did, however, serve two years as Instructor in Biology at Amherst College, six years, from 1899 to 1905, as Professor at Olivet College, one year in 1929 as Acting Professor at Williams College, and in 1936 as Acting Associate Professor at Stanford University.

In 1905, Clark joined the staff of the Museum of Comparative Zoölogy where he was appointed Curator of Echinoderms and served from 1927 to 1946 as Curator of Marine Invertebrates, during which time he built up one of the largest and best arranged collections of echinoderms in the world. In the course of his work he made many collecting trips, including five expeditions to Jamaica, two to Bermuda, and also to Tobago, the west coasts of Central and South America, the Galapagos Islands, China, Japan, and three trips to Australia, where he obtained the material for his publications on the echinoderms of the southern continent.

His first papers on butterflies were published when he was only 13, and during the rest of his life his publications appeared at frequent intervals. His bibliography includes three titles on butterflies, six on reptiles and amphibians of Michigan, more than a dozen on birds, and more than 100 on echinoderms. His publications on birds included two editions of the 'Birds of Amherst and Vicinity' (1887 and 1906) and various papers dealing with distribution, variation, anatomy and especially pterylography, a subject in which he never lost interest. He was elected an Associate of the A. O. U. in 1886 at the early age of 16 when a student at Amherst, his first note appeared in 'The Auk' at 17, and he was made a full Member in 1902.—T. S. PALMER.

WILLIAM AUGUSTUS JEFFRIES, a Member of the American Ornithologists' Union from the time of the formation, in 1901, of that class of membership, died in Milton, Massachusetts, February 20, 1948, as the result of a street accident.

He was born in Boston on February 13, 1856, the son of John Jeffries and Anna Lloyd (Greene) Jeffries. Growing up in Boston, he prepared for college at the famous 'Noble's' School, and entered Harvard at the age of fifteen. Upon graduation, in 1875, he spent a year in the Harvard Law School, and then entered his father's firm. The placing of high-class mortgages was their principal business, and Mr. Jeffries acquired such a reputation for sound judgment in regard to investments

that trusteeships came to him until he had little time for other affairs. He continued to carry on this work to the very end of his long life.

His interest in ornithology began early, and with his younger brother, John Amory Jeffries, he spent much of his spare time in active field work, chiefly in the neighborhood of Swampscott, Massachusetts, where his family had a summer home.

In 1878 he became a member of the Nuttall Ornithological Club, when the Club itself was less than five years old, and he continued active in his membership for seventy years until his death. For fifty of those years he was an officer of the Club. His clear judgment and wise counsel gave him great influence in the Club's affairs, and his wholesome, genial presence bettered the meetings.

In his earlier years, in their field work, he and his brother John were almost inseparable, and their activities were mostly near home. A short collecting trip they made in 1879 in New Brunswick brought welcome knowledge from a then little-known region, as did a similar one in the North Carolina mountains in 1888. The two brothers spent most of the winter and spring of 1883 in southern California, from which they returned with widened experience and a considerable collection.

Their collection of birds, about two thousand skins, he gave to the Museum of Comparative Zoölogy in Cambridge a few years ago.

In 1893 Mr. Jeffries married Clemence, the daughter of Alexander Brooks Eustis and Aurora (Gerlaud) Eustis. She died about a year before him. They had two children, John Amory Jeffries and Clemence, the wife of Paul Dudley Childs; both are now living in Milton. There are eight grandchildren.

It is difficult to do justice to Jeffries' character or to his mind. That he was always a courteous gentleman, every one knew. He had an exceptionally clear and logical mind, and seldom have I known any one at all comparable to him in utter integrity or in courage. Integrity and courage were outstanding, not only in his actions throughout his life, but in his mental attitudes and their expression. But with it all there went such kindliness and tact that his penetrating judgment of others was always mellowed.

He was reserved, and talked so little about his own affairs that few persons knew how many-sided and serious his interests were. To its sudden and unexpected end his life was a full and active one. Years could not age him.—CHARLES FOSTER BATCHELDER.

JOHN LEONARD BAER, an Associate of the American Ornithologists' Union, elected in 1920, died at Caledonia Bay, Panamá, May 28, 1924 in his 50th year. He was born at Bryansville, York Co., Pennsylvania, July 28, 1874, and received his early education in the public schools, York Collegiate Institute, and West Nottingham Academy, Cecil Co., Maryland. He entered Lafayette College at Easton, Pennsylvania in 1898, but three years later was compelled to abandon further study on account of an eye injury. He then entered the insurance business and in 1904 became manager of a drug store.

His main interest, beginning in boyhood days, was the study of the American Indian and the collection of Indian relics in the four adjacent counties of York and Lancaster in Pennsylvania and Harford and Cecil in Maryland. Later he acquired an interest in birds and became a non-resident member of the West Chester, Pennsylvania, Bird Club. Still later he became interested in botany and 'star gazing.'

Baer entered government service in 1918 in the U. S. National Museum and enrolled as a student in George Washington University, specializing in anthropology. He received the degree of A.B. in 1920 and that of M.S. in 1922. In 1921 he was

appointed Acting Curator of American Archaeology in the Museum. His last assignment was in the Division of Physical Anthropology where he served until June 1924, when he joined the Marsh Darien Expecdition to Panamá, as the representative of the Smithsonian Institution. His death was due to infection of a wound caused by the bite of an insect. He married twice: (1) Gertrude A. Scarborough, in 1904; and (2) Mary L. Arnold, in 1921, who has kindly furnished the information on which this notice is based.—T. S. PALMER.

STEWART HENRY BURNHAM, an Associate of the American Ornithologists' Union, elected in 1919, died at Ithaca, New York, September 25, 1943, at the age of 73. He was born at Vaughn, New York, October 6, 1870, studied at Stanford University from 1893 to 1895, and graduated from the University of Michigan in 1899 with the degree of B.S. He served as Museum Aid at the New York Botanical Garden from 1901 to 1903, Assistant Botanist at Cornell University from 1904 to 1905, Assistant State Botanist of New York from 1905 to 1913, and Botanist at Cornell from 1920 to 1922, and subsequently as Assistant Curator.

In addition to his membership in the Union, he held memberships in the American Association for the Advancement of Science, the Botanical Society of America, the American Fern Society (Secretary 1919–1922), the American Forestry Association, the Sullivant Moss Society, the Sierra Club, and the Vermont Botanical Club.—T. S. PALMER.

WILLIAM OTTO EMERSON, a Life Associate of the American Ornithologists' Union elected in 1916, died at Hayward, California, December 24, 1940, in his eighty-fifth year. He was born at Union, McHenry County, Illinois, about 60 miles west of Chicago, on March 2, 1856. In the early seventies he moved to Hayward, California, which became his home for the rest of his life.

Emerson made few long trips away from home. A visit to Europe about 1890, when he went to study art in Paris, a trip to San Diego County in 1884, one to the Sierras and one to the Farallon Islands comprise his major expeditions. When Professor F. E. L. Beal visited California about 1904 to study the food habits of fruit-eating birds, he made his headquarters with Emerson at Hayward and together they visited the more important orchard districts of central California.

Emerson was a near neighbor of Dr. J. G. Cooper and was himself one of the pioneer bird students of California. He knew personally most of the ornithological workers of his time and took an active part in any coöperative bird work. With the organization of the Cooper Ornithological Club he was recognized as one of the leaders, served as its first President and was reëlected to a second term. In later years he again served as President of the Northern Division.

Emerson's publications were mostly in the form of short notes contributed to current ornithological journals and began to appear about 1880. Most of his early notes were published in the 'Ornithologist and Oologist,' the 'Nidologist,' 'Zoe,' and later in 'The Condor.' Up to 1898 he had published more than 30 notes and added 10 species to the California bird list. His notes on the birds observed in the Poway Valley, San Diego County in 1884, and those on the birds of the Farallon Islands were perhaps his most important contributions. With the establishment of the 'Proceedings of the Cooper Ornithological Club' (later 'The Condor'), he contributed the first article, a biographical sketch of Dr. J. G. Cooper, based on personal and first-hand information. In his later years he was most interested in popularizing bird study, especially among young people. An artist of no mean ability, Emerson devoted much attention to painting and photography. His energy was also devoted

to floriculture, and in his garden he grew quantities of daffodils, narcissus, and other flowers for the market. His collection of birds and eggs, numbering several thousand specimens, was acquired by the California Academy of Sciences.—T. S. PALMER.

CHARLES EUGENE JOHNSON, an Associate of the American Ornithologists' Union, elected in 1919, died at Syracuse, New York, June 6, 1936, at the age of fifty-six. He was born in Oslo, Norway, April 24, 1880, graduated from the University of Minnesota in 1906, and received his A.M. in 1907 and his Ph.D. in 1912 from the same institution. He remained at the University of Minnesota for six years as Instructor in Comparative Anatomy of Vertebrates, then spent two years as Assistant Professor and three years as Associate Professor of Zoology at the University of Kansas.

In 1923 he received an appointment as Professor of Forest Zoology in the New York State College of Forestry. At the same time he served as field naturalist of the Roosevelt Wildlife Station and in 1926 became Acting Director of the Station. In addition to his membership in the Union, he had memberships in the American Association for the Advancement of Science, the American Society of Mammalogists, the Association of Anatomists, and the Society of Zoologists. Professor Johnson's contributions to 'The Auk' were limited to a few brief notes on the occurrence or habits of the birds of Kansas, Minnesota, and New York.—T. S. PALMER.

HARRY HOWELL KENNEDY, a Life Associate of the American Ornithologists' Union, died at his home in Oakland, California, October 31, 1943, in his 73rd year. He was born at Syracuse, New York, April 10, 1871, and lived for some years at Reno, Nevada. About 1936, he moved to Oakland, California, and took up his residence on Stonewall Road, near the northern boundary of the city, adjoining Berkeley. By an arrangement with the post office, mail on this street was delivered by the Berkeley carrier.

In 1920, Kennedy was elected a Life Associate of the Union but through some error his name was entered in the list of members as Harry Howard Kennedy. This explains the discrepancy in his name and address in the A. O. U. records. Apparently he never contributed any papers to 'The Auk' or published anything especially on birds.—T. S. PALMER.

GIFFORD PINCHOT, a Life Associate of the American Ornithologists' Union, elected in 1910, died in New York, October 4, 1946, at the age of eighty-one. He was born in Simsbury, Connecticut, on August 11, 1865, the son of James W. and Mary Eno Pinchot. His education was received at Phillips Exeter Academy and Yale University, where he graduated in the class of 1889. After a year or two of study abroad in forestry, he opened an office in New York in 1891 as a consultant in forestry and the following year began, on the Vanderbilt estate at Biltmore, N. C., what was probably the first systematic forestry work in the United States.

In 1898 he was appointed Forester and Chief of the Forestry Division in the U. S. Dept. of Agriculture, subsequently developed into the Forest Service, and continued as Forester until his retirement in 1910. During the next few years he took part in the Bull Moose campaign of 1912, served as a member of the Federal Food Commission, and in 1920–1923 was State Forester of Pennsylvania. From 1923 to 1927 he served as Governor of the state and was elected to a second term in 1930. Under the laws of Pennsylvania, a Governor cannot succeed himself; hence the interim between his first and second terms. During this time he organized an expedition to the Caribbean Sea and South Pacific in 1929 on the yacht 'Mary

Pinchot.' On this expedition he was accompanied by his family and by Dr. A. K. Fisher as ornithologist and Howard H. Cleaves as photographer. The party visited Grand Cayman, Old Providence, St. Andrews, Greater and Lesser Swan Islands in the Caribbean area and various islands in the Pacific, including Cocos, the Galapagos, the Marquesas Islands and Tahiti. It resulted in the discovery of a new hummingbird (*Anthracothorax nigricollis pinchoti*) on St. Andrews Island. The report on birds by Fisher and Wetmore includes notes on 59 species on the Caribbean and 94 on the Pacific islands.

Pinchot was a member of a number of boards and commissions on conservation and forestry and was the author of numerous reports on these subjects. His principal publications on forestry were his report on the white pine (1896), Adirondack spruce (1898), and 'Primer of Forestry' (1899). At the time of his death he had just finished his history of conservation which was planned for publication in 1947 under the title 'Breaking New Ground.'—T. S. Palmer.

Harriet Eliza Richards, an Honorary Life Associate of the American Ornithologists' Union, died at her home in Brookline, Massachusetts, September 1, 1945, in the 87th year of her life. Born in West Bridgewater, Massachusetts, May 30, 1859, she spent most of her life in Boston, and for nearly half a century was associated with the Massachusetts Audubon Society, the oldest state Audubon Society now in existence. She was one of the founders of the Society in 1896, served as its first Secretary until 1903, then as Director until 1941, and finally as Honorary Vice President from 1941 until her death. She served for many years on the Women's Council of Boston University and founded the Harriet E. Richards Cooperative Home for Girls.

Miss Richards was elected an Associate of the Union in 1900, and in 1901 was the representative from Massachusetts at the organization meeting of the National Committee of Audubon Societies, the predecessor of the National Association of Audubon Societies organized in 1905. She was also a life member of the Appalachian Mountain Club.—T. S. Palmer.

Eustace Lowell Sumner, an Associate of the American Ornithologists' Union, elected in 1938, died at Berkeley, California, October 1, 1943, in his 72nd year. He was born in Cambridge, Massachusetts, July 10, 1871, the son of Arthur and Mary Augusta (Upton) Sumner, and brother of Prof. Francis B. Sumner. The family moved to East Oakland, California, in 1874, and ten years later to Colorado Springs, Colorado. Here and at Minneapolis, Minnesota, most of his boyhood days were spent and here he returned to engage in business. From 1905–1920, he served as advertising editor of the journal 'Marine Engineering.' In the latter years he moved to Rhode Island and in 1922 to Pomona, California. Shortly after the death of his wife, in 1928, he took up his residence in Berkeley and began active work in bird banding. Most of his banding was done in Strawberry Canyon, Berkeley, in San Mateo County, and on the Hastings Natural History Reservation in Monterey County. For several years he served as President and Business Manager of the Western Bird Banding Association.

In a sketch in 'The Condor' for January, 1944, from which the above facts were chiefly drawn, Sumner is described as a man always ready to help others, not only as a helpful adviser, but as an assistant in banding birds and miscellaneous work such as preparing the indexes of 'The Condor' for 1941 and 1942.—T. S. Palmer.

John Douglas Turnbull, an Associate of the American Ornithologists' Union, died at the age of 72 at Vancouver, British Columbia, October 19, 1938 (not Nov. 7,

1941 as erroneously stated in 'The Auk' for April, 1945, p. XVI). He was born in Scotland in 1866, came to America and settled in Vancouver in 1888, where he engaged in business as a customs broker. His principal hobbies were gardening and observing birds.

He joined the Pacific Northwest Bird and Mammal Society in 1926 and the A. O. U. in 1927. He did not contribute to 'The Auk' and apparently published little if anything on birds. A friend in describing his characteristics says: "He collected nothing but impressions and shot only glances at the birds. A very kindly, friendly soul loving the outdoors with a passion."—T. S. PALMER.

WILLIAM MASSIE WALKER, JR., an Associate of the American Ornithologists' Union, elected in 1938, died of pneumonia at Nashville, Tennessee, January 23, 1947, at the age of 46. He was one of a family of seven children and was born September 20, 1900, a few miles east of Hopkinsville, Kentucky. He was educated in the public schools and Vanderbilt University where he received the degrees of B.S. in 1924 and M.S. in 1925. After graduation he was employed as a chemist in the laboratories of the Division of Tests of the State Highway Department in Nashville until 1934 when he moved to Knoxville to accept a position in the T. V. A. laboratories, where he remained until his return to the Highway Department at Nashville in 1945.

At Vanderbilt University, Walker met Dr. G. R. Mayfield and, in 1932, joined the Tennessee Ornithological Society. Four years later he was elected secretary-treasurer of the Nashville chapter, a position which he filled for three years. He was president of the Knoxville chapter, later served as secretary-treasurer, curator and regional editor of 'The Migrant' for the Nashville area and in 1939–1940 was state president of the Tennessee Ornithological Society. He was also a member of the Kentucky Ornithological Society, the Wilson Ornithological Club and the Tennessee Academy of Science.

Walker was a keen observer and essentially a field ornithologist. The results of his observations on migration, census outings and other field trips appeared in a series of some 35 notes published in 'The Migrant' and 'The Kentucky Warbler.'

He is survived by his wife, whom he married in 1935, by a son, William Massie Walker III, by his parents, Mr. and Mrs. W. M. Walker, Sr. of Hopkinsville, Kentucky, and by three brothers and three sisters. A more extended account of his activities on which this notice is based, was published by H. C. Monk in 'The Migrant' for March, 1947.—T. S. PALMER.

PHILIP COATES WALTON, an Associate of the American Ornithologists' Union, elected in 1938, died June 5, 1944, at the age of 33, from wounds received in action on the beach in Normandy, France. He was born in Merchantville, New Jersey, November 28, 1910, the only son of Mrs. Coates Walton, graduated at Rutgers College and took postgraduate work at Cornell University. During the war he entered the service in March, 1942, attended Officers Candidate School at Edgewood, Maryland, and was commissioned Second Lieutenant in April, 1943. In October he was sent overseas to England where he was stationed for about six months. He was assigned to the army of invasion and at the time of his death was attached to a chemical warfare unit.

Although he was a member of the Union for more than five years, he apparently published no notes on birds, but 'Cassinia' for 1944, pp. 28–34, contains excerpts from his letters to Robert L. Haines which include notes on species observed at various places during the last two years of his life.—T. S. PALMER.

THE AMERICAN ORNITHOLOGISTS' UNION AT A GLANCE

ORGANIZED—in New York City, Sept. 26, 1883: Incorporated—in Washington, D. C., Nov. 15, 1888.

OBJECTS: "The advancement of its members in Ornithological Science; the publication of a journal of Ornithology and other works relating to that science; the acquisition of a library; and the care and collection of materials relating to the above objects, under the restrictions and regulations established in its By-Laws."

OFFICERS: President, two Vice-Presidents, Secretary, Treasurer, and 9 elected Councilors. Two Councilors appointed by Cooper Club and Wilson Club. Officers, the Editor and ex-Presidents are ex-officio members of the Council.

MEMBERS: Associates (unlimited), Members (150), Corresponding Fellows (75), Honorary Fellows (20), Fellows (50), Fellows Emeriti, Patrons. (Total membership in 1948 about 2120.)

DUES: Annual—Associates $3, Members $4, Fellows $5.
Life-Members of any class $100; Patrons $1000.

INCOME: From annual dues, sale of publications, life memberships, and contributions.

MEETINGS: Annual—usually in October or November.

PUBLICATIONS: 'The Auk,' a quarterly journal in 62 volumes, with 5 general indexes: 1876–1900, 1901–1910, 1911–1920, 1921–1930, 1931–1940. 'Check-List of North American Birds': 1st ed., 1886; 2d ed., 1895; 3d ed., 1910; 4th ed., 1931. 'Code of Nomenclature,' 1886; Revised ed., 1908. (See Auk, '24, 142.)

BREWSTER MEDAL: The income from a fund of $7250, established in 1919 by the friends of William Brewster, awarded biennially (now annually) to the author of the most important work relating to the birds of the Western Hemisphere published during the preceding six years. Awarded in 1921 to Robert Ridgway, in 1923 to A. C. Bent, in 1925 to Todd and Carriker, in 1927 to John C. Phillips, in 1929 to C. E. Hellmayr, in 1931 to Mrs. Florence M. Bailey, in 1933 to F. M. Chapman, in 1935 to H. L. Stoddard, in 1937 to R. C. Murphy, in 1938 to Thomas S. Roberts, in 1939 to Witmer Stone (posthumously), in 1940 to James L. Peters, in 1941 jointly to Donald R. Dickey and A. J. van Rossem, in 1942 to Margaret M. Nice, in 1943 to Alden H. Miller, in 1944 to Roger Tory Peterson, in 1945 to H. Albert Hochbaum, in 1947 to Francis H. Kortright.

WHERE TO FIND FURTHER INFORMATION

ADDRESSES OF OFFICERS AND MEMBERS—Annual list usually in April Auk. Copies of present list (1948) will be available at 50 cents each.

THE AUK (LOCATION OF SETS)—Auk, '19, 634; '20, 348; '24, 207; '29, 584.

THE AUK IN PUBLIC LIBRARIES—Auk, '30, 609.

BIOGRAPHIES OF DECEASED MEMBERS—Auk, '35, lviii and current issues.

BREWSTER MEDAL—Auk, '20, 29; '22, 86; '24, 125; '25, 484; '26, 69; '28, 71; '30, 219; '32, 52; '34, 53; '36, 57; '38, 317; '39, 113; '40, 142; '41, 139; '42, 144; '43, 139; '44, 187; '45, 350; '46, 131; '48, 108.

BY-LAWS: Auk, '27, xi; Auk, '38, 330–340.

DATES OF PUBLICATION OF THE AUK (1912–1943) follow the Index in each volume or the title pages in later volumes.

HISTORY OF THE UNION: Allen, J. A., 'A Seven Years' Retrospect,' 1891; 'The A. O. U.,' Bird-Lore, 1899, 143.
Palmer, T. S., 'The A. O. U.,' Am. Mus. Journal, '18, 473; 'Looking Backward,' Auk, '24, 139; Fifty years' progress of American Ornithology, 1933, 7–27.

MEETINGS: Auk, '24, 143; '30–'36, back cover of October numbers.

MEMBERSHIP:—Auk, '24, 140; '48, 109; Fellows, '18, 110; Foreign Members, '18, 266; Members, '18, 384; Associates, '18, 513.

PERMANENT FUNDS: Auk, '20, 513. (See yearly Treasurer's and Trustees' reports.)

THE AUK

A Quarterly Journal of Ornithology

ORGAN OF THE AMERICAN ORNITHOLOGISTS' UNION

Manuscripts should be typewritten, double-spaced, if possible. Titles should be brief, within one printed line. Avoid footnotes. References to literature may be inserted in parentheses in the text or listed at the end of the paper; consult recent issues of 'The Auk' for the style of citation used. Long articles should have a brief summary at the end. Mark copy only for *italics*. Avoid Roman numerals and extensive or ruled tables. Line drawings should be in India ink on white paper or cardboard; if reduction will be necessary, details must be correspondingly bold. Captions should be brief; discussions belong in the text. Common and Latin names of North American birds should follow the A. O. U. Check-List except in taxonomic papers giving formal discussions of the changes. Except on request, no proofs of 'General Notes' or short communications will be sent to authors.

Twenty-five reprints of leading articles are furnished authors free of charge. Reprints from 'General Notes,' 'Correspondence,' etc., and those from leading articles in excess of twenty-five must be paid for by the author, and must be ordered from the editor when the manuscript is submitted. Printed covers can be furnished at additional cost.

All articles and communications intended for publication and all books and publications intended for review should be sent to the Editor.

John T. Zimmer
American Museum of Natural History
79th Street and Central Park West
New York 24, N. Y.

Information relative to advertising, subscriptions, requests for back numbers of 'The Auk,' as well as for other publications of the Union, change of address and remittances should be sent to the Treasurer and Business Manager. Claims for replacement of missing or defective copies of 'The Auk' will not be honored unless received by the Business Manager within six months of publication of the particular number involved.

Frederick C. Lincoln
Fish and Wildlife Service
Department of the Interior
Washington 25, D. C.

ATTENTION
ALL MEMBERS

The Treasurer and Business Manager desires to thank those members who have returned their copies of The Auk for January, 1947. Their generosity has made possible the inclusion of this number in sets that would otherwise be incomplete.

The need for additional copies is still urgent so it is requested that any other members who do not intend to maintain a permanent file of The Auk, return their copies of the January number as soon as they are through with them.

FREDERICK C. LINCOLN
Treasurer and Business Manager
Fish and Wildlife Service
Department of the Interior
Washington 25, D. C.